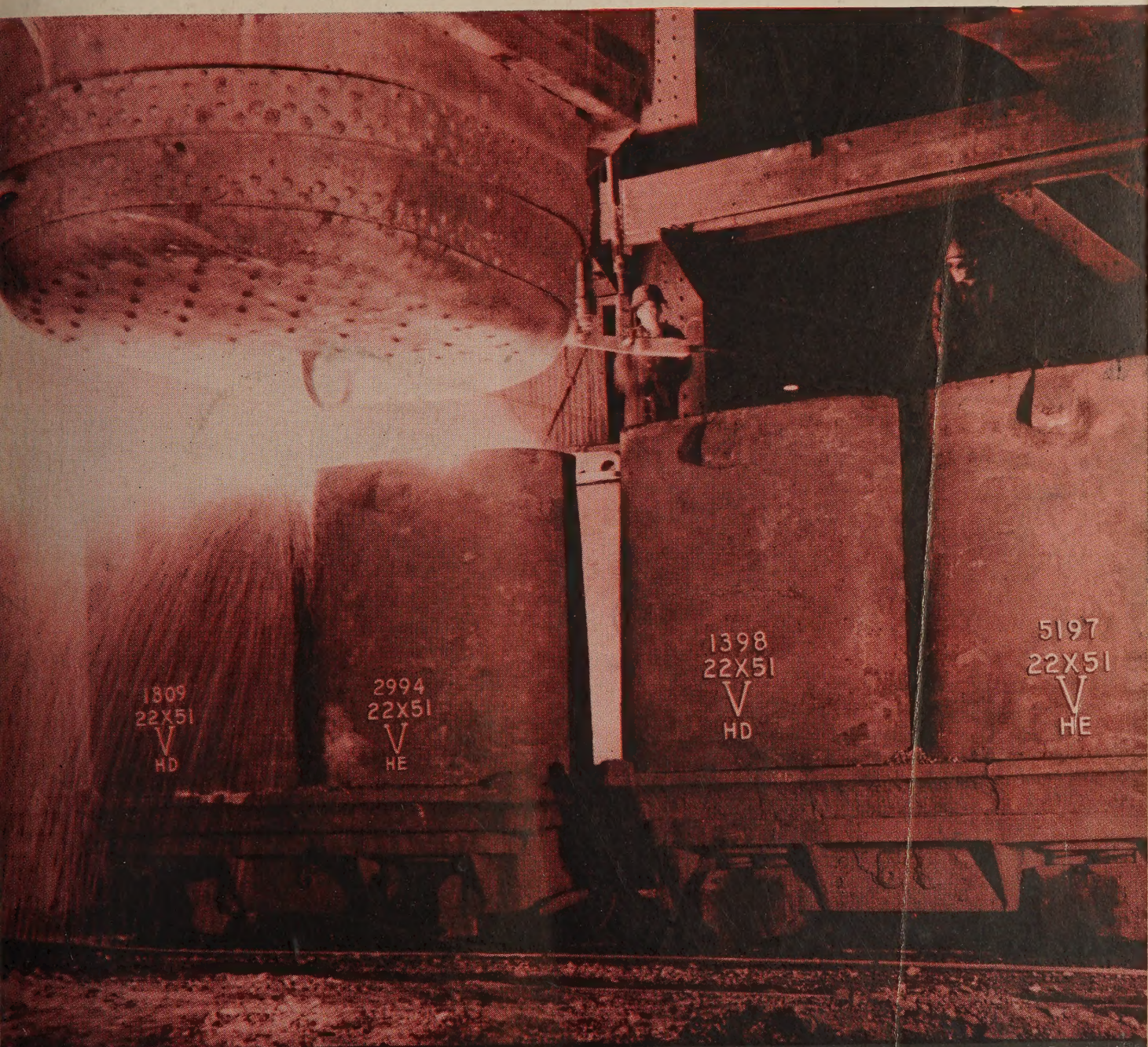


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g Record Changer -p. 86
g Adjusting Screws -p. 93
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The Illinois U Library

IRON AGE

AUGUST 26, 1948



VALLEY MOULD & IRON CORP.

General Offices: HUBBARD, OHIO

Western Office: Chicago, Ill.

Northern Office: Cleveland, O.



As the white outline indicates, a standard unit of much greater frame size would be required to do the work of Speedaire. The unit operates a Ruggles-Cole Dryer, built by the Hardinge Co., Inc., York, Pa.

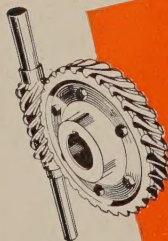
SPEEDAIRE ... for 3 years 24 hours a day

THREE years ago, a South Carolina kaolin plant installed one of Cleveland's new fan-cooled Speedaire worm gear speed reducers to drive a rotary kiln. It has operated almost continuously, day and night, ever since, with unimpaired efficiency in spite of the heat and dust.

As the photograph indicates, a limited area was available to install a speed reducer, but it was entirely adequate for Speedaire, because it occupies 42% less space than a conventional worm gear drive of comparable capacity. Speedaire also saved \$128.50 on initial cost.

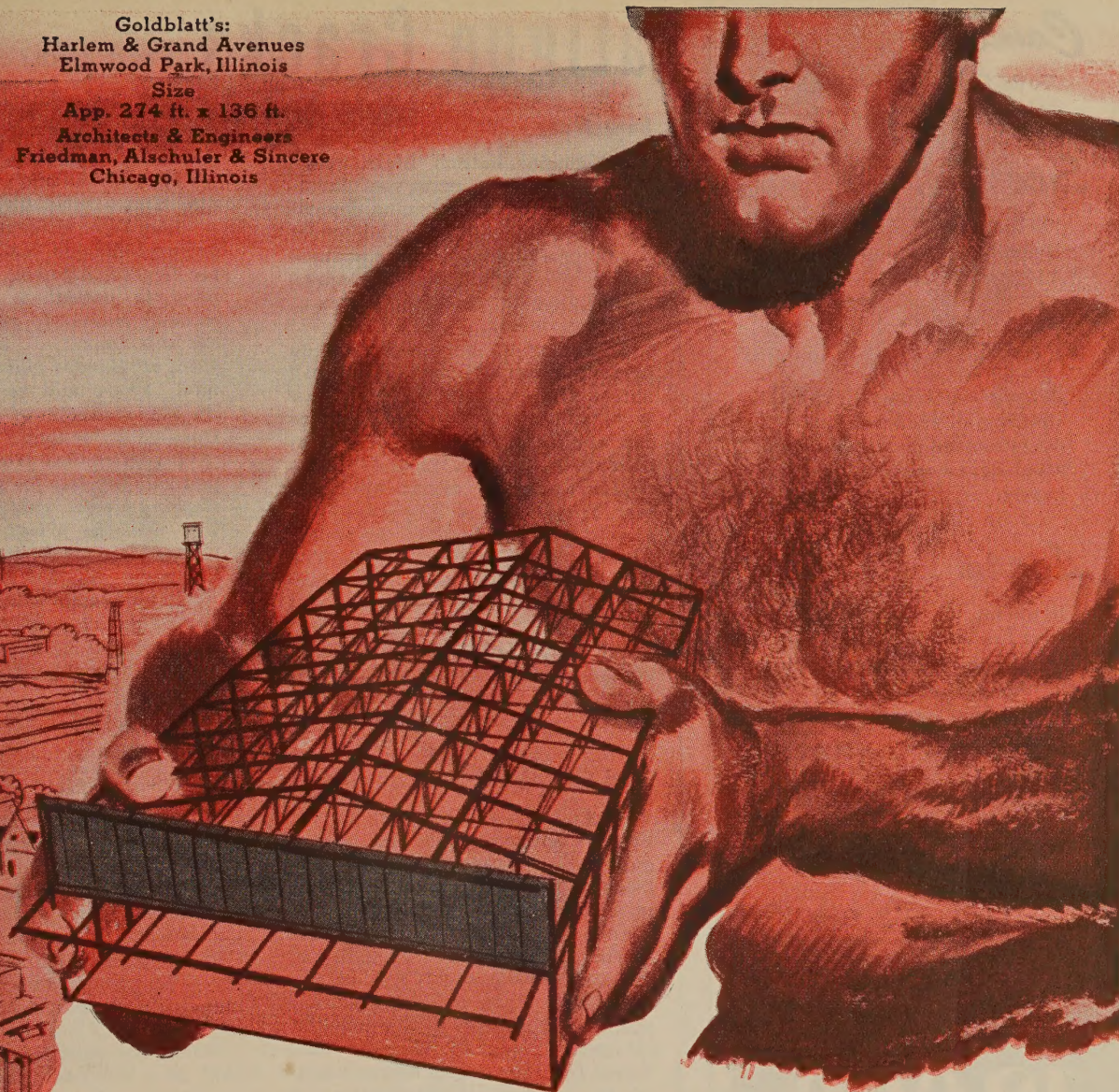
Because Speedaire is fan-cooled, it will do more work—will deliver up to *double the horsepower* of standard worm units of equal frame size, at usual motor speeds. It can be installed economically on many applications where other types have been used heretofore—giving you the advantage of a compact right-angle drive. Speedaire gives the same long, trouble-free service characteristic of all Clevelands.

For full description, send for Catalog 300. The Cleveland Worm & Gear Co., 3252 East 80th St., Cleveland 4, Ohio.
Affiliate: The Farval Corporation, Centralized Systems of Lubrication.
In Canada: Peacock Brothers, Limited.



CLEVELAND Worm Gear *Speed Reducers*

Goldblatt's:
Harlem & Grand Avenues
Elmwood Park, Illinois
Size
App. 274 ft. x 136 ft.
Architects & Engineers
Friedman, Alschuler & Sincere
Chicago, Illinois



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A tough job—but Calumet came through! A tight completion schedule plus cramped space conditions were some of the complications overcome in the erection of Goldblatt's newest store. Complete structural steel detailing, fabrication and erection were finished in record time by our Calisco Engineering Division. A typical Calumet job—tough but satisfying!

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Sept. 28, 29, 30, Oct. 1, 1948

sponsored by

ASSOCIATION OF IRON & STEEL ENGINEERS
1010 Empire Building, Pittsburgh, Pa.
Atlantic 6323

Fatigue Cracks

BY C. T. POST

Low Note

• • Thomas Sutneff Blair, ostensible an honest toiler in your favorite family journal's brains department, but in reality an undercover agent for Fatigue Cracks, has turned up a bit of intelligence which should fill with terror the hearts of all music lovers.

Following up an assignment on personnel aptitude tests, T.S.B. ran across a midwestern factory which gives a series of twelve tests to job applicants, one of which, apparently unrelated to the plant's products, covers music appreciation. The better a man knows his symphonies and sonatas, the poorer his chances of getting the job. The company claims that it has given the same test to its employees and found that music lovers all too often are malcontents or poor workers. Allegedly the company is getting results—phenomenally low turnover on new employees.

Add Garage Doors

• • Addenda to the story of the San Francisco physician, whose garage doors were actuated by the beam of his headlights falling on a photo-electric cell until, one day, the sun setting over the Golden Gate started them flapping up and down:

According to Herb Caen, columnist for the San Francisco Chronicle, another local amateur scientist hit upon the idea of sending out radio waves from his car as he approached the garage, thus actuating a relay putting the door mechanism in operation. He, too, came home one day to find the doors opening and closing of their own volition. On close investigation, he learned that airplanes contacting the San Francisco airport were operating on the same wavelength.

Personally, we think the tale would have been better in reverse, with the garage door man raising hob with the air traffic, and the FCC hot on his trail, as it should have been.

Cloudy Crystal

• • Latest of the generous offers from all over the world to help fill the news pages to the east of us comes from a Hollywood gentleman who makes his living as a professional predictor. To demonstrate his ability in leafing the pages of the future, the seer encloses a copy of a column written for another publication. This, it turns out, was a mistake, for the date the predictions appeared was June 29.

Among other tremorous events,

here's what was slated to happen this summer:

"Truman — and Forrestal (the Democratic ticket)."

"The Tito incident will not be forgotten too easily—watch for Greece, Albania, and Hungary to appeal to the UN, causing Russia to really walk out this time! . . . by August 12th, all Europe will be in turmoil. There will be a change in the cabinets of England, Italy, and Portugal!"

"I predict that from now on you will pay less for your food, clothing, and entertainment. The peak in prices has been reached—so look for a slow decline."

"From heat to cold, from dry to wet . . . I predict that the weather will keep you infuriated all summer!"

That last one came close, anyhow. Exclamation point.

Ersatz

• • For really long range predictions, the all-time favorite around your f.f.j. is an elaborate presentation, supported by lengthy statistical tables, which appeared in the October 12, 1939 issue. Title: The Coming Collapse of German Industry. The author was a former German business man, recently returned from Berlin.

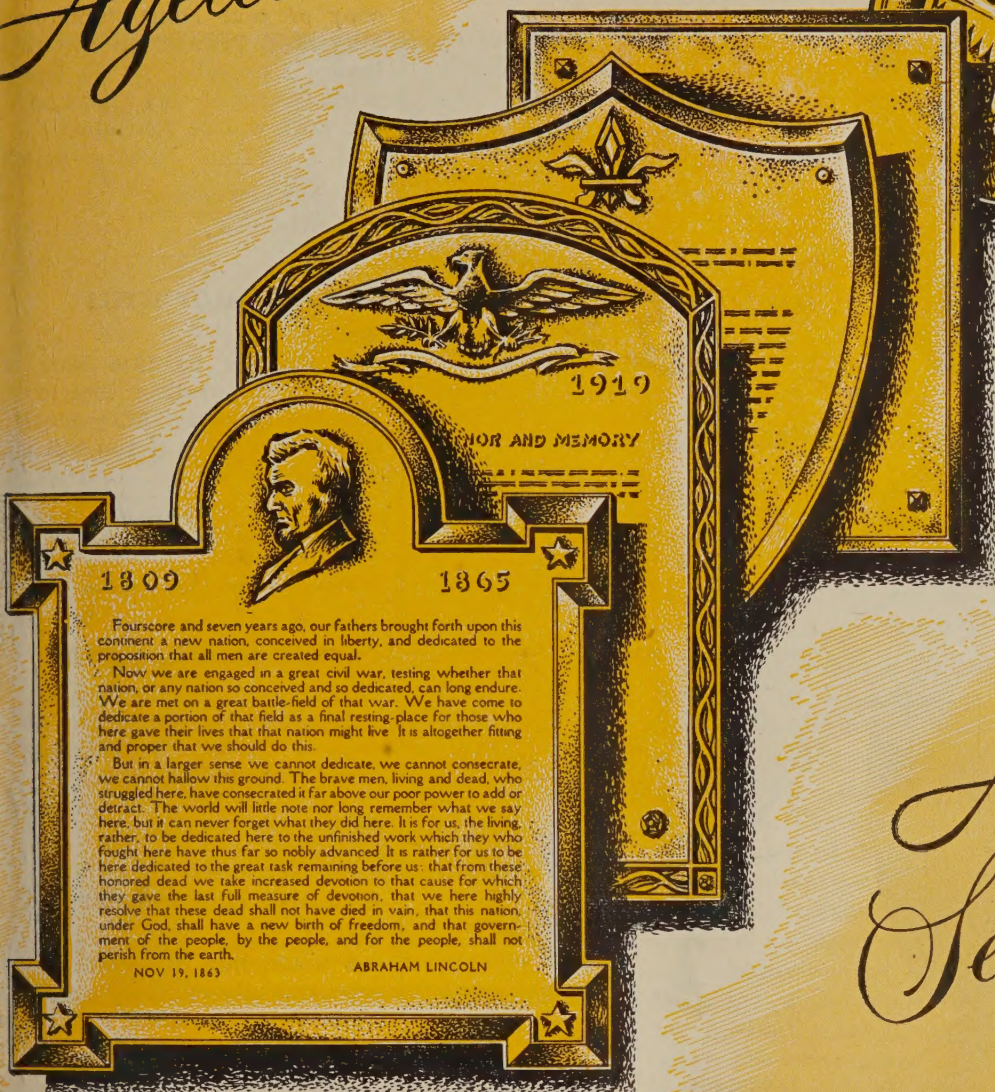
Since that episode, pinned on the wall as a reminder, the brains department cooks up all predictions in its own kitchens, using recipes handed down in the family for generations. A particularly tasty concoction appeared this year in the July 1 issue which said: 1. "Phillips' steelworkers are going to get a raise in pay within a few weeks." 2. "Just as steel wages will go up, so will steel prices." 3. "Soon after the wage announcement." 3. "The big blockbust which is expected to hit steel customers soon will be an f.o.b. misnomer in steel sales."

Despite disparaging remarks from amateur chefs, the whole batch was cooked and out of the oven within a month.

Takeoff

• • Our southern California agent reports that a manufacturer of hydraulic equipment for aircraft among the new and expanded companies in that area, is Manlove and Christian Manufacturing Co. Plans with M. & C. equipment are dispatched with considerably more than a wing and a prayer.

Ageless Words—



Ageless Setting

the Dependable Metals *Brass and Bronze*

Imperishable cast brass and bronze have since time immemorial proved themselves among man's most useful metals.

Engineers turn to them for industrial castings when strength, reliability, machinability and freedom from corrosion are the basic demands on the metal.

As employed by architects and design-

ers, these friendly, warm, time-defying metals contribute to the character of our homes, public buildings and institutions. They are the accepted insignia of permanence and basic quality.

Specify brass and bronze castings. Old friends of the foundryman and machinist, they are available *NOW!*

The Brass and Bronze Ingot Institute (formerly Non-Ferrous Ingot Metal Institute) suggests your local foundry for help with all casting problems.

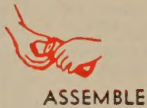
CAST BRASS AND BRONZE

SHORT CUT

Old Method



5 Steps



Nickeloid Method

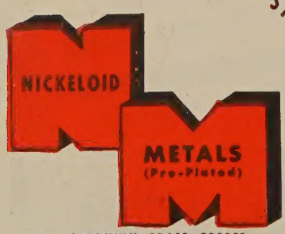


2 Steps



If you are plating or finishing your product in any way and are looking for ways to simplify manufacturing procedure, would you devote a half hour or so of your time to learn from one of our sales engineers how Nickeloid Metals may possibly fit into your picture?

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NICKELOID
COMPANY**
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PERU 2, ILLINOIS

Dear Editor:

TOOL STEEL CHART

Sir:
I would like to obtain a copy of your chart "Comparative Tool Steel Brands" in the July issue. I am glad to see Iron Age print charts of this type and the work will be continued.

W. W. GILBERT
Assoc. Prof.

University of Michigan,
College of Engineering
Ann Arbor, Mich.

WELDING ALLOY STEELS

Sir:
In the Jan. 24, 1946 issue, was an interesting article on Welding of Nickel-Alloy Steels. I will appreciate it if you will mail me a copy of the article.

L. F. DUNN
Supervisor of Reclamation
Atlantic Coast Line Railroad
Wilmington, N. C.

• Tearsheets have been mailed.—Ed.

CARBIDE MILLING CUTTERS

Sir:
Please enter our order for a copy of "How to Use Carbide Milling Cutters for Milling" at \$1.10.

Sandvik Steel, Inc.
New York

G. J. ANDERSON

PIPE AND TUBE MAKERS

Sir:
I would like to receive a list of pipe and tube manufacturers in the U. S. And if possible, can you send me a similar list to cover the rest of the world?

N. J. PELLICANO
Far Eastern

U. S. Steel Export Co.
New York

• A list of U. S. manufacturers has been sent. A list of world producers contained from "Ryland's Directory," a publication listing the steel plants of the world and the products of each.—Ed.

STEEL CONVERSION PRIMER

Sir:
Will you send us a copy of the article "A Primer on Steel Conversion" in the July 29 issue.

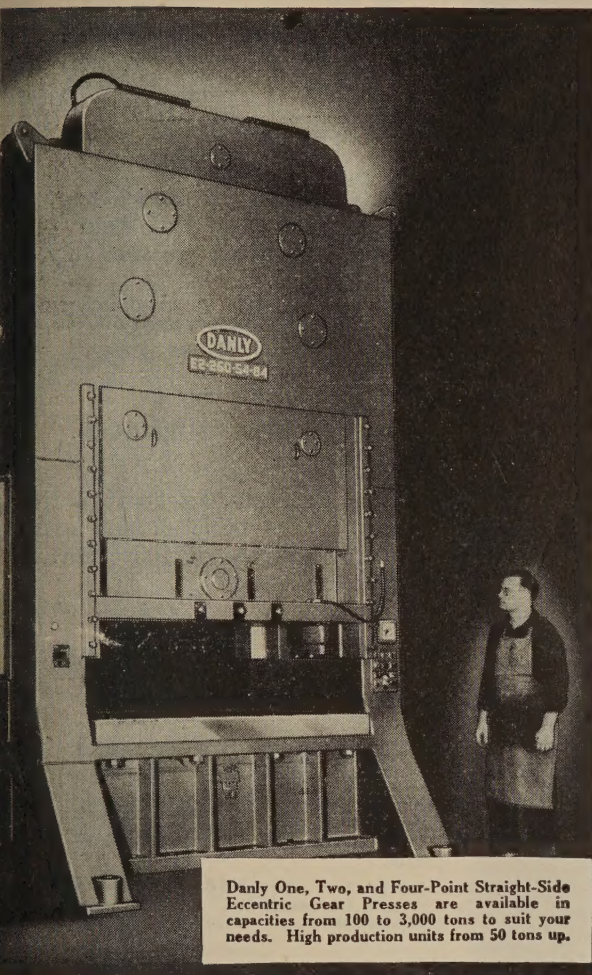
Jones & Yoder
New York

S. W. JONES

WELD METAL COMPOSITION

Sir:
In the May 20 Newsfront item concerning a graphical method of predicting weld metal composition and structure which facilitates the joining by metal.

How the Pitman Wrist-Pin Design Promotes Longer Press Life on



Danly One, Two, and Four-Point Straight-Side Eccentric Gear Presses are available in capacities from 100 to 3,000 tons to suit your needs. High production units from 50 tons up.

DANLY Presses



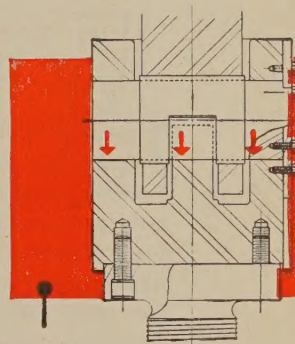
View showing pitman wrist-pin and replaceable bronze bushing, connection and slide adjustment. Long, accurate guide eliminates bending stresses in adjusting screw.

SIMPLIFIED CONSTRUCTION PERMITS ACCURATE MACHINING OF PITMAN AND SLIDE PARTS—ASSURES LONGER PRESS LIFE, LESS DOWN-TIME

Here is more proof of the care taken in designing Danly Presses to assure longer press life, less down-time.

The application of the pitman wrist-pin and the construction of the slide adjusting mechanism permits accurate machining and precision fitting of the component parts.

As illustrated, three-point support for the power stroke eliminates possibility of wrist-pin shearing, and minimizes deflection. The wrist-pin is locked in the guide of the slide adjusting unit to prevent oscillation. Wear on the pin and pitman is minimized by use of a *hardened and ground* pin, and aluminum-iron alloy bronze bushings with special properties for toughness and resistance to wear. The moving parts of the connecting assembly are lubricated by the main built-in circulating filtered oiling system.



Wrist-pin hardened and ground to precision tolerances is accurately fitted and locked in machined guide. Replaceable wrist-pin bushing of tough wear-resistant bronze alloy reduces maintenance. Three-point bearing support on power stroke prevents pin shearing, minimizes deflection.

Check These **DANLY** Press Features

- New Exclusive Ventilated Air Friction Clutch—gives long trouble-free service—cuts maintenance costs.
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- Fully Enclosed Crown Construction.
- Extra Long Bronze Lined Slide Ways and Precision Machined Gibs.
- Safe Automatic Electrical Controls with Reverse and Anti-Repeat Feature.

write for **Free** bulletin

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DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52ND AVENUE, CHICAGO 50, ILLINOIS



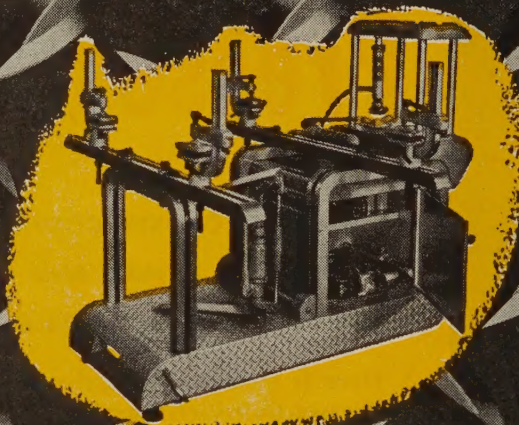
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Economy
Service**

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welding of dissimilar alloys and superalloys. We would appreciate having more information on the subject.

RALPH H. HOPP
Technical Librarian

Battelle Memorial Institute
Columbus, Ohio

• Further information on the subject given in "Welding Dissimilar Metals with Stainless Electrodes" in the July 1 issue.—

WELDING CLAD STEELS

Sir:

We would appreciate a copy of the article "How to Weld Clad Steels" appearing in the July 1 and 29 issues.

C. C. D'AMICO
Mgr., Special Steels Division

Joseph T. Ryerson & Son, Inc.
Los Angeles

SINTER IN BLAST FURNACES

Sir:

Will you send us tearsheets from your July 29 issue of the article "Effect of Sinter on Blast Furnace Practice."

J. B. SCUDDER

John E. Greenawalt
New York

STREAM POLLUTION

Sir:

Please send tearsheets of article "Abatement of Stream Pollution by Being Pressed" from the July 8 issue.

HARRY L. PETERSON

Crown Chemical Co.
Indianapolis

PRACTICAL MANAGEMENT

Sir:

Please send me a copy of "Practical Management." Postal money order for \$3.00 is enclosed.

M. M. MRVICHIL
Project Engineer

Pettibone Mulliken Corp.
Chicago

NONFERROUS SPECIFICATIONS

Sir:

This is to order the following books: "Nonferrous Alloy Specifications" at 25¢; "Precision Investment Casting—Lost Wax Process" at \$1.00; and the "Metal Finishing Manual" at \$3.00.

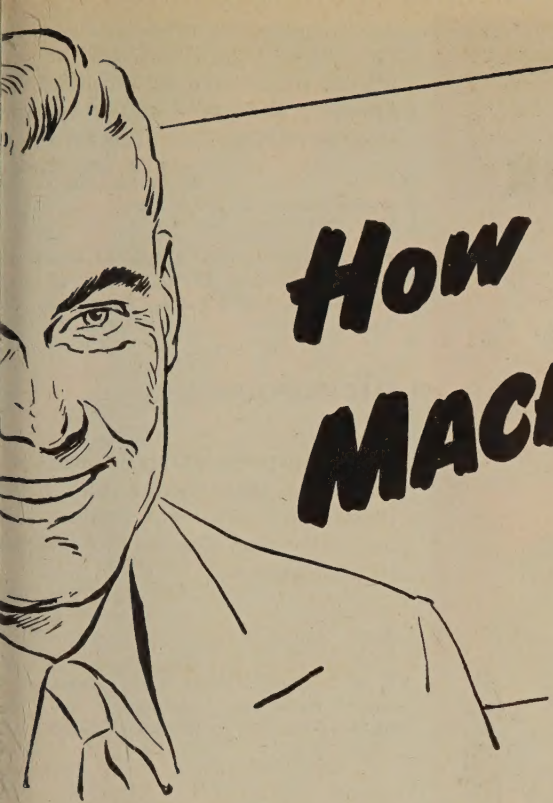
E. D. O'HARA
Engineering Director

A. O. Smith Electrical Mfg. Co.
Los Angeles

ATOMIC THICKNESS GAGE

Sir:

We have noticed an item in the June 15 issue which refers to the use of radioactive isotopes in gaging



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Figure your machining speeds—your operator time—your daily requirements—and your down-time. It will show you why more and more smart production men are turning to the No. 12 Hydraulic for a consistent volume of work.

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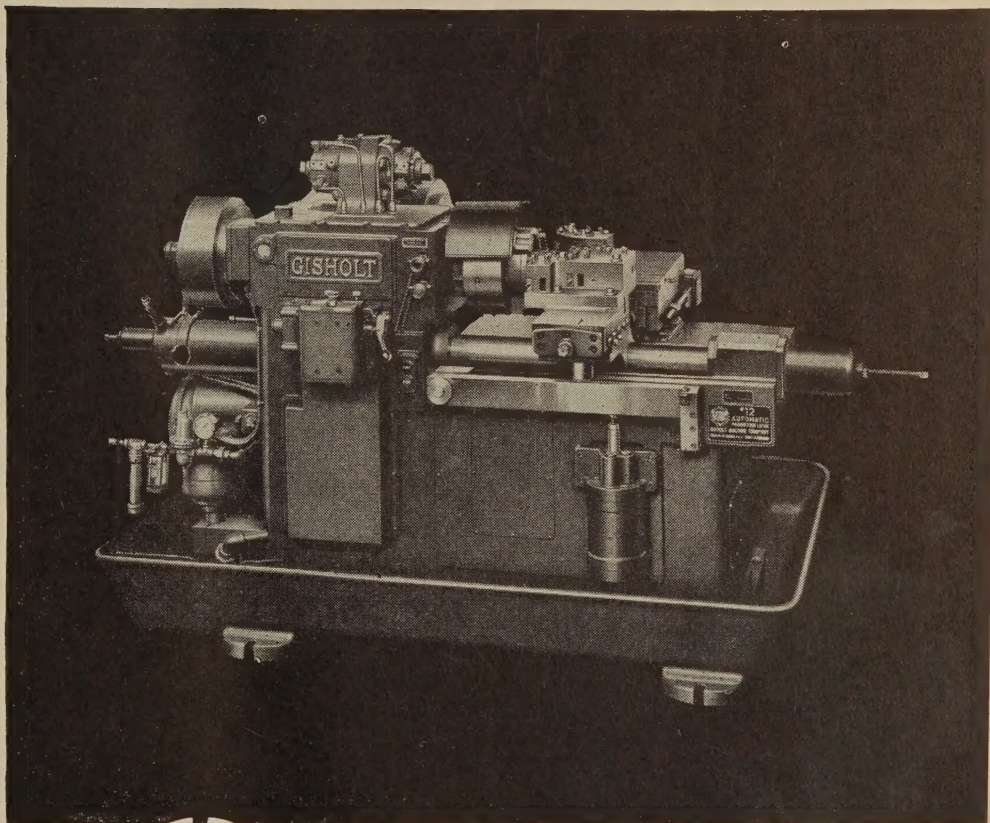
Easier Job Set-ups—No cams or drums. Adjustment points for slide control are conveniently placed between shoulder and level levels—open and accessible. Tool blocks and tool bits are simple to position. There's no time lost here.

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Simple Construction—There are fewer parts requiring adjustment or replacement. You expect less and have less down-time on the No. 12 Hydraulic. Write for the catalog—Form 1104A.

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R.D. Wood Company
EST. 1803

for measuring the thickness of plastic films. We would appreciate knowing the name of the company that developed this application.

L. J. BERBERIC
Insulation Department

Westinghouse Electric Corp.
East Pittsburgh, Pa.

• The gage, further details of which were given in the July 29 issue, was developed at Goodyear Tire & Rubber Co., Akron, O.—Ed.

ELECTROPOLISHING

Sir:

We are particularly interested in obtaining information on electropolishing. Will you please mail the literature you may have pertaining to this subject.

HARRY DeJUR
Secretary-Treasurer

DeJur Amsco Corp.
Long Island City, N. Y.

• A number of Iron Age articles on this subject have been reprinted in the "Metal Finishing Manual," available at \$3.00 a copy.—Ed.

HEAT RESISTANT ALLOYS

Sir:

We would like to have a copy of the article "A Summary of Heat Resistant Alloys from 1200° to 1800°F," published in the March 18 and April 8 and 15 issues.

W. O. WETMORE
Head, Metallurgy Section

U. S. Naval Ordnance Test Station
Inyokern, Calif.

• Reprints of the article are 20¢ each.—Ed.

METAL FINISHING MANUAL

Sir:

The general foreman of our Metal Finishing Department has requested that I inquire about your booklet "Metal Finishing Manual." We wonder if it would be possible to obtain a copy.

E. B. WEAVER
Asst. Purchasing Agent

Gillette Safety Razor Co.
Boston

• Copies are \$3.00 each.—Ed.

POWDER METALLURGY

Sir:

Please send me tearsheets of the article, "Powder Metallurgy," appearing in the August 8 issue.

GAYLE DAHME

American Smelting & Refining Co.
Barber, N. J.

EMPLOYEE INCENTIVE

Sir:

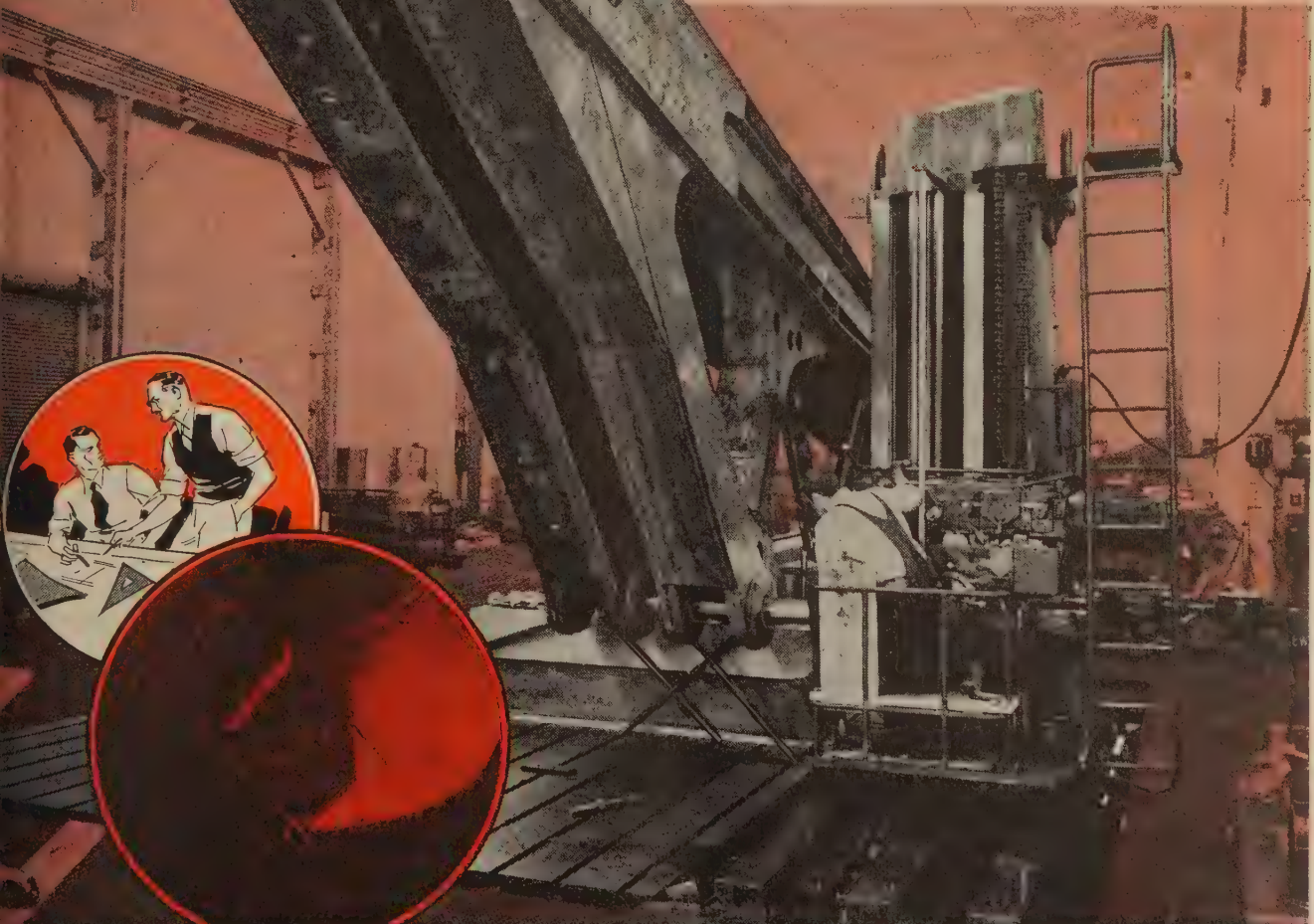
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The Mahon Company stands ready to meet your requirements in welded steel regardless of size, weight or shape. A staff of design engineering experts, backed by highly skilled craftsmen, is your assurance of a better, smoother appearing job embodying every advantage of Steel-Weld Fabrication. Complete machining facilities, within the Mahon organization, include equipment especially adapted to handle heavy, cumbersome work of any type. If you have procurement or fabricating problems, Mahon Steel-Weld Fabrication may be the answer.

THE R. C. MAHON COMPANY
Detroit 11, Michigan

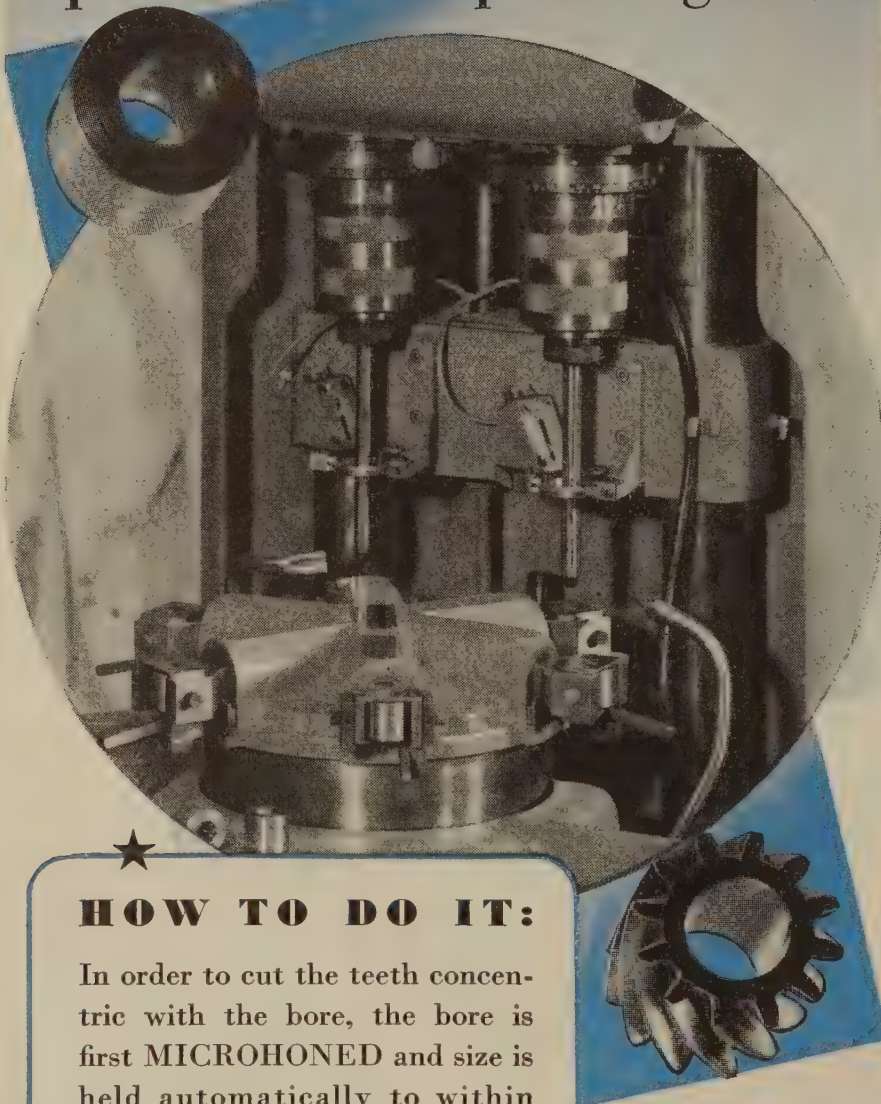


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Rucker "Share of Production" as described in the article "Based on Production Value" in July 1 issue.

J. R. SW
Tre

Chandler Products Corp.
Cleveland

• A. W. Rucker, Eddy-Rucker Nickel Inc., Cambridge, Mass., who develops plan, will give you further information

FRENCH STEEL MAKERS

Sir:

In your July 1 issue appeared article "French Alloy and Tool Industry." I would appreciate tearsheet of this article.

R. L. STOC

Armzen Co.
Middletown, Ohio

TIME STUDIES

Sir:

May I obtain a reprint of article "Right and Wrong of Study Computations" from the 17, 1944 issue?

JOSEPH B. RO
Industrial En

Phoenix Mfg. Co.
Joliet, Ill.

• Tearsheets have been sent.—Ed.

HEAT TREATING

Sir:

We should greatly appreciate receiving tearsheets of the following articles: "Modern Heat Treating Reference Index" from the July issue, and "New Temper Designations for Aluminum Alloys" from the June 24 issue.

H. C. FRIEDEM

American Electro Metal Corp.
Yonkers, N. Y.

CHROME PLATED STEEL

Sir:

We would like to know if you have available a list of producers manufacturing chrome plated steel. We are not referring to chrome plating but rather concerns who furnish the complete product.

S. A. SHAN

Athos Steel Service
Philadelphia

• A list of producers has been sent.—

TEXAS STEELERS

Sir:

We will appreciate your sending us a tearsheet of the article "Steel Industry Production" appearing in the May 6 issue.

J. D. HENDER
National Managing D

American Assn. of Small Business
New Orleans

THOMAS L. KANE

Publisher

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August 26, 1948

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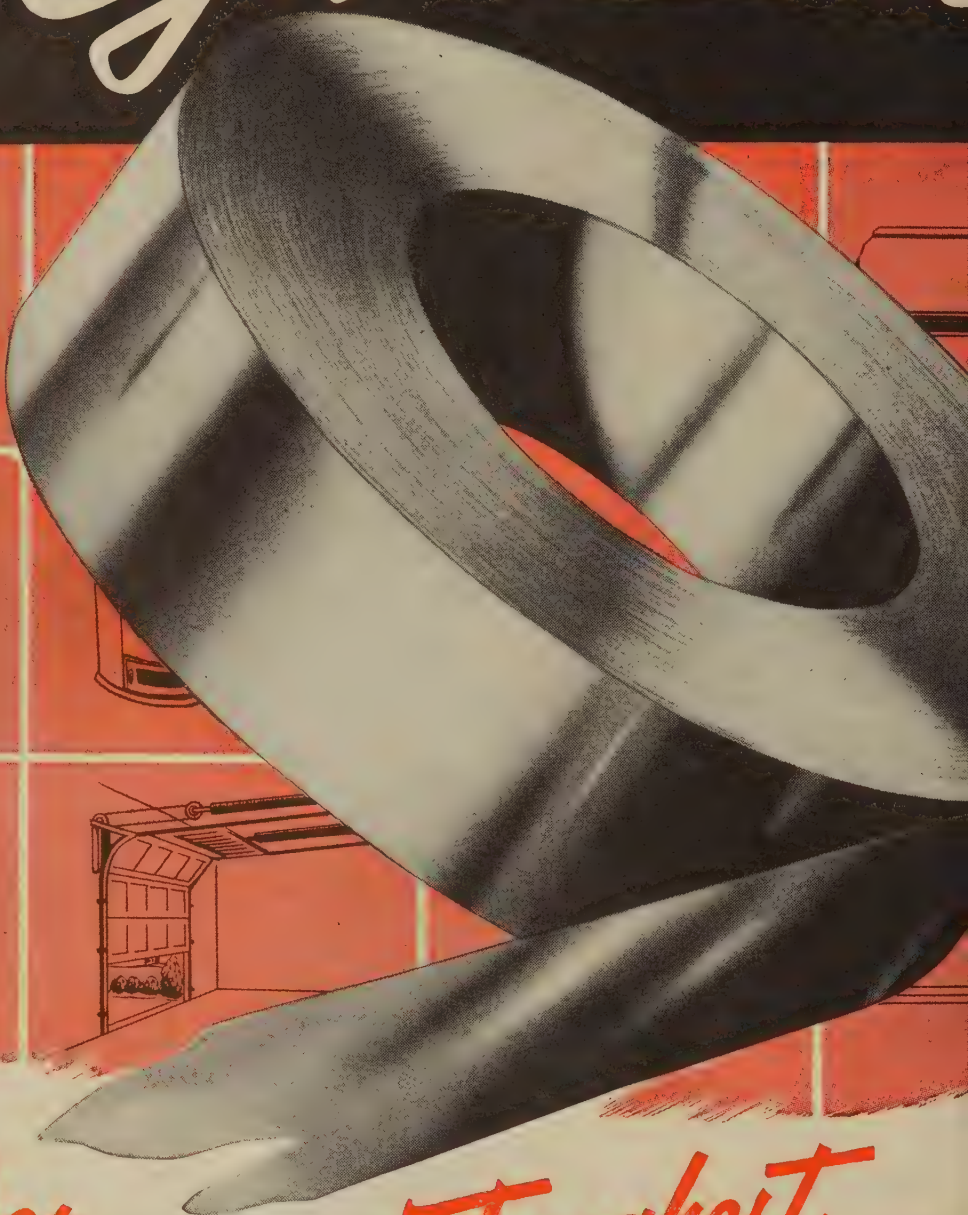
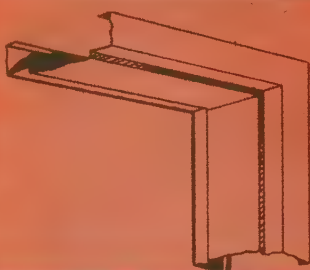
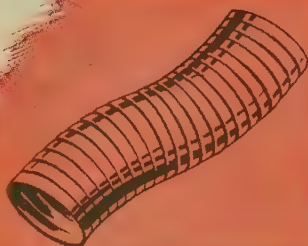
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WEATHERTIGHT

Galvanite

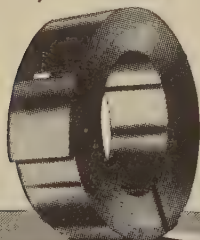


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A Poke at Paradise

WHEN Oksana Stepanova Kosenkina jumped from the third story window of the Russian consulate in New York City to avoid return to her homeland she dramatized in language, that even the most naive could understand, a major propaganda defeat for the communists. For the fate that she held worse than death was renewed life in the Soviet paradise. This was no idle rhetoric, no malicious fascist fabrication, no consummate capitalist conspiracy. A plain proletarian soul with all the benefits of intensive indoctrination under the direct influence of high communist officials, and with all the ties of home tugging at her heart and mind, nevertheless chose a plunge to the stony courtyard three stories below than return to her native Russia.

Taking their cue from the phony premise of Karl Marx that the lot of the worker was a sinking existence of "progressive misery" and harsh exploitation under capitalism red propaganda has contrasted life under the two conflicting ideologies. With considerable success they documented the persistent fallacies of the "Red Prussian." The well written but misleading saga of Okies migrating (in cars) to California, the sexual aberrations of southern mountaineers in a play that was lauded by our soft boiled liberals, movies of colored slums outside Atlanta, the squatter shacks of derelicts in the Jersey meadows during the early thirties, these have all been cunningly presented to the folks at home as typical shots of life under capitalism. As long as the unfortunate victims of such skull-duggery are unable to see for themselves their prison walls may well seem a protective barrier. The disciplinary apparatus of the state is subject to less strain and the boys in the Kremlin can feel a bit more secure.

Therein may be found the sole purpose of the iron curtain. The measures that constitute this curtain are described as a protection against the hostile espionage and the aggressive designs of those imperialist commonwealths that hover hungrily on the borders of the "great democracy." Actually the curtain is a porous shell that covers the foul substance of a monstrous hoax. The principal purpose of the barrier that divides the two worlds is to prevent exposure of the tyranny, the slavery, the wretched living conditions that inevitably follow the adoption of communism and the denial of personal freedom. The security measures that prevent the normal flow of commerce, the free movement of persons and the unimpeded exchange of ideas promote only the security of the boys in the Kremlin. They are among the devices by which an illegitimate oligarchy proposes to perpetuate its power. When a Kosenkina, a Samarin, an Alexeev, a Gouzenko, a Kravchenko, a Barmine risks life in order to escape, it becomes a little difficult to maintain the hideous fiction of a milk-and-honey existence behind the curtain.

These intrepid rebels against oppression and deception jeopardize the position of the Moscow clique. They tend to undermine the reliability of every Russian agent whose duties take him abroad. They shake the faith of the stupid intellectuals, the "fillies", the "suckers", the "useful innocents" upon whose support communism depends.

It is little wonder Ambassador Panyushkin called on Kosenkina to "confirm" her "intention" to go home, and Molotov in an unprecedented demarche summoned our Bedell Smith to the Kremlin for direct representations. Such defections strike at the root of Soviet power.

Joseph Stagg Lawrence

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► There will be no quick solution to the f.o.b. mill problem in the steel industry. Nor is there much chance of a return to the basing point method of selling steel. The most that steel officials look for is a law which will make legal the absorption of freight by producers so that they may compete in distant territories. Even that will not come until much water has passed over the dam -- if then. The key to the whole thing is the amount of pressure that is generated by steel consumers -- not steel producers.

► Preliminary laboratory experiments with a thick-skinned magnesium-zirconium alloy airplane wing have proven favorable. The new wing, which may replace the aluminum wing on some airplanes, will, however, be tested further on the P-80 to determine fully the suitability of the alloy as a substitute for aluminum.

► The anticipated rush to switch steel shipments in the Middlewest from rail to truck or water has not materialized -- yet. But steel buyers are not overlooking the possibilities of reducing transportation costs through trucking. Some sources believe many such negotiations are in process. Others believe the threat of rising truck rates and the lack of adequate dock facilities will keep this trend at a minimum.

► Although brake drums are not a part of automobile engines, they provide an interesting example of the application of special casting methods in connection with cast irons. Many different materials have been tried for this important part. But, according to an automotive authority, none have been found that will surpass cast iron, particularly the high carbon irons.

► The growing tightness of alloy bars is one of the more significant trends in the steel industry today. A Middlewest firm, anticipating the situation, has just completed an exhaustive test program on triple alloy steels which will be substituted for single and double alloy grades. The SAE 8600 and a new chrome-moly-nickel steel grades have been selected to replace many of the present semi and full-hardening grades. Tests on carburizing grades have not been completed as yet.

► Government people who have been, and still are, for more steel capacity have not given up. Not much has been said recently -- but some agencies are still strong for additional capacity. They do not believe what industry has repeatedly stated -- that there is enough steel capacity to take care of needs over the next few years, and that increased capacity now planned and underway will more than take care of long term requirements. The administration is expected to keep harping on the need for more capacity -- even if the government itself has to build it.

► The raw materials pinch is destined to hit the steel industry early in 1949. One large producer estimates that shortly after the first of the year it will be necessary to shut down at least one blast furnace -- for lack of iron ore or coke.

► Flexibility in machining fixture design is exemplified in a device recently used to position bell housings for drilling and boring. By substituting gage blocks of various lengths, the vertical and horizontal positions of the indexing fixture can be varied to accommodate 72 different cast iron and aluminum parts.

► Feeling exists among some automotive experts that the malleable industry has made more progress relatively in recent years than either the gray iron or steel foundries. Melting equipment, for instance, is rapidly being changed from powdered coal furnaces to duplex units consisting of cupolas in conjunction with air or electric furnaces that permit a continuous flow of metal. The trend toward a higher silicon-carbon ratio that promotes secondary graphitization has decreased annealing time materially. And additions of agents such as boron, and small amounts of bismuth, tellurium and molybdenum have made possible the manufacture of much larger castings without graphitization than previously thought possible.

► High compression engines are coming into the auto industry -- but only as fast as high octane fuel is made available at neighborhood gas stations. Most sources believe that when adequate fuels are available, all auto producers will have overhead valve high compression engines. They give up to 50 pct improvement in fuel economy.

Continuous Casting

--The Asarco Process

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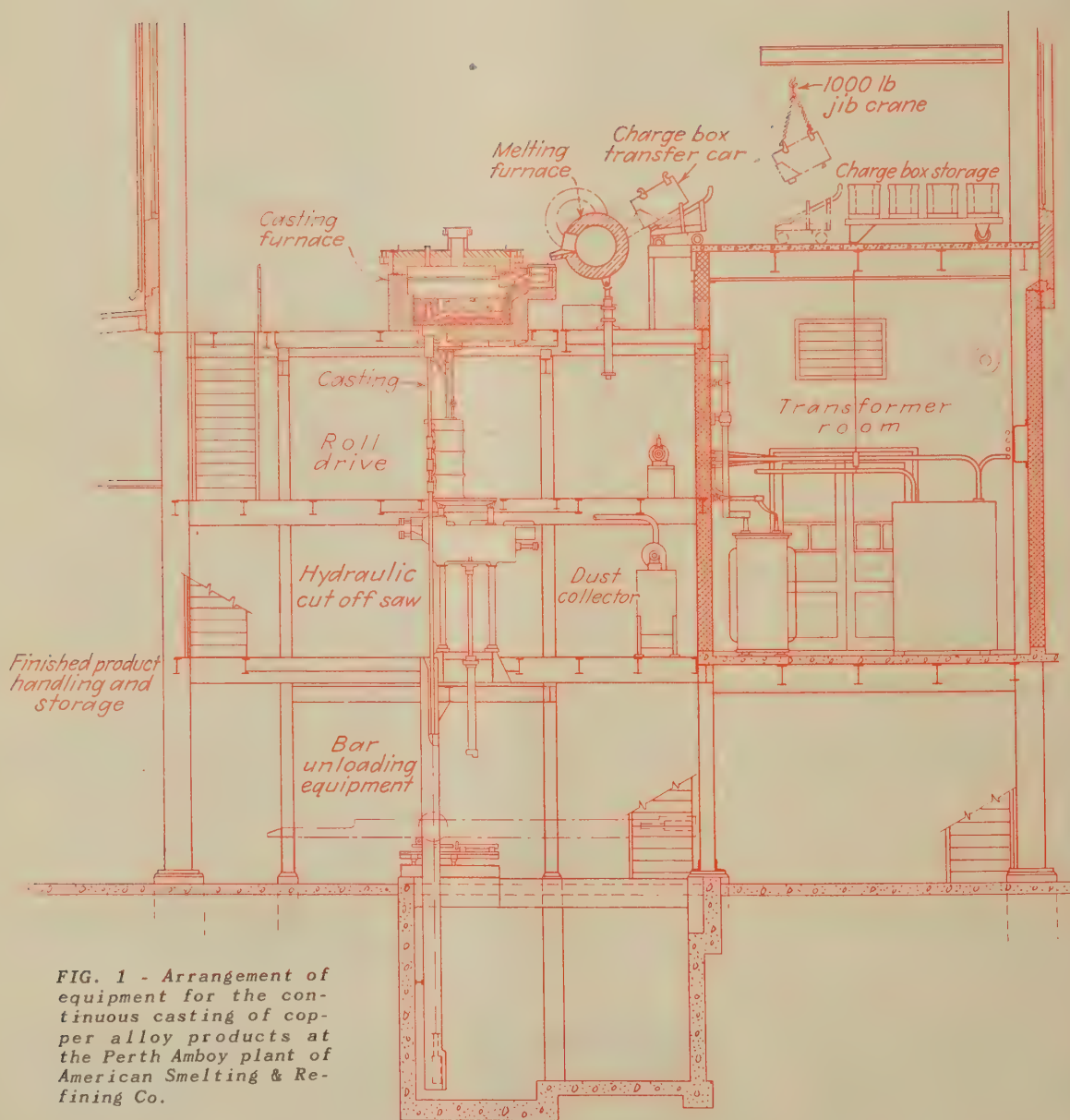


FIG. 1 - Arrangement of equipment for the continuous casting of copper alloy products at the Perth Amboy plant of American Smelting & Refining Co.

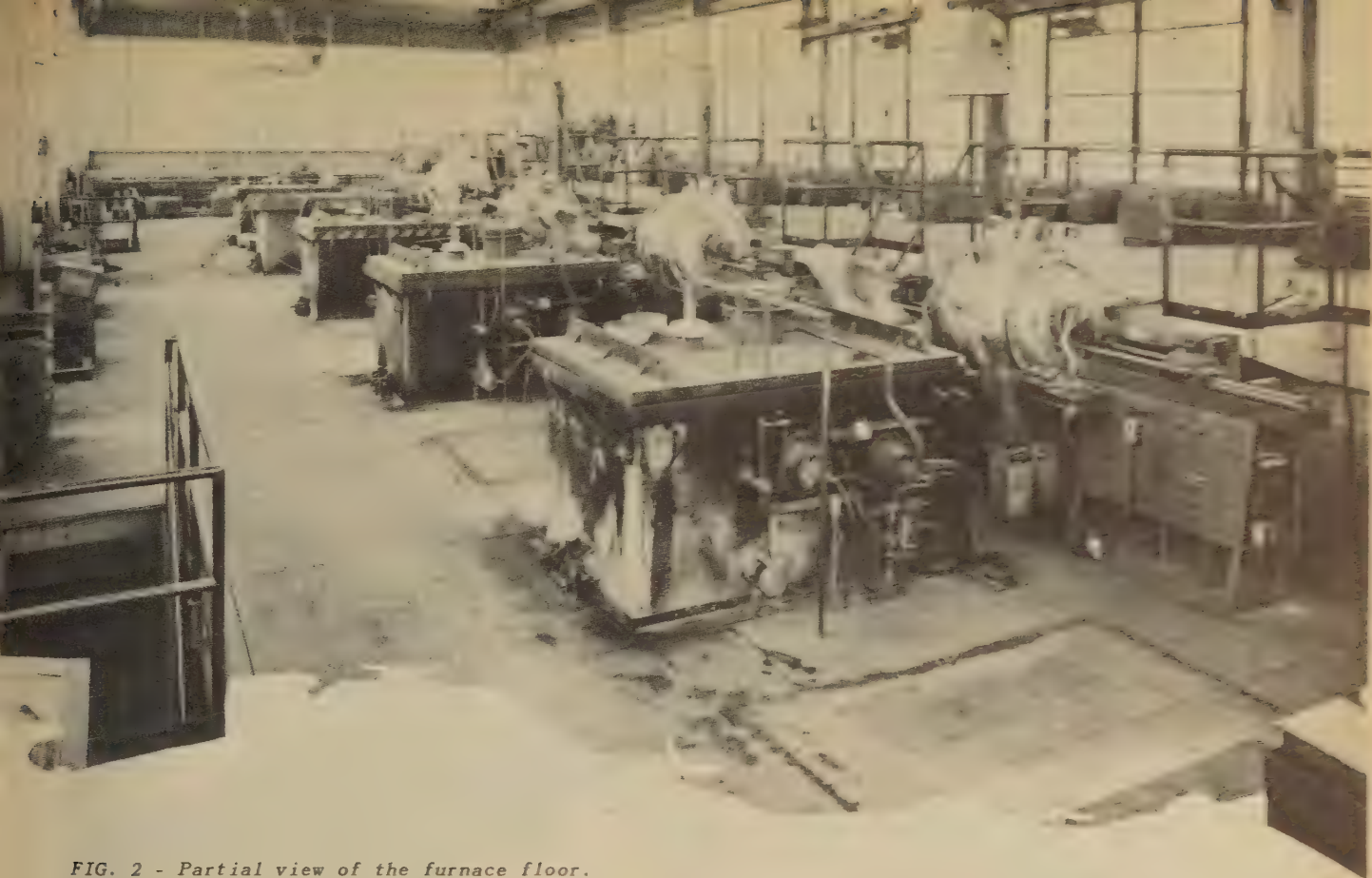


FIG. 2 - Partial view of the furnace floor.

Playing an important role in the development of the technology of continuous casting is the work done on the Asarco process by American Smelting & Refining Co. in the production of copper and copper base alloys. Certain features of the Asarco machines were originally described in *THE IRON AGE*, Feb. 24, 1944. This present article, however, represents the first extensive description of the Asarco units and includes the first photographs of the machines. It is particularly timely in view of the great interest currently centering on continuous casting.

SINCE Sir Henry Bessemer first proposed a scheme for continuously casting molten metal in 1857¹ the intriguing possibilities of such a process have resulted in a persistent search for suitable practical operating methods. Until about 15 years ago the various Governmental patent agencies did by far the majority of business in the field since little, and in most cases nothing, in the way of products ever emerged from the equipment described in such complete detail in the voluminous patent literature that followed Sir Henry's proposal. Gradually, however, the mechanical and economic stumbling blocks have been overcome to the extent that today at least four different processes² are in commercial use, excluding the several types of machines developed for the specific purpose of applying coatings of bearing metals to steel or bronze backs.

Fundamentally, three of these processes have reservoir furnaces discharging a free falling

stream of molten metal to a disconnected mold, generally made of copper and water cooled, where it is continuously solidified and withdrawn. Some type of orifice is usually employed in combination with manual adjustment of the metal feed to allow maintenance of a constant molten metal level in the mold. Where the cross sectional area of the product and the linear speed of casting allow delivery of metal volumes well in excess of 10,000 cu. in. per hr the flow from such orifices

¹ See "Documentary," by Sir Henry Bessemer, *THE IRON AGE*, Apr. 11, 1940, p. 48.

² A description of continuous casting of steel at the Babcock & Wilcox Co. was published in *THE IRON AGE* August 19, 1948, page 72; a general review of the development of the technology of continuous casting up to 1940 was presented in the article "Continuous Casting," *THE IRON AGE*, Apr. 4 and Apr. 11, 1940; a review of later developments, with extensive illustrations of various processes, was given in an article in *THE IRON AGE*, Feb. 24, 1944.

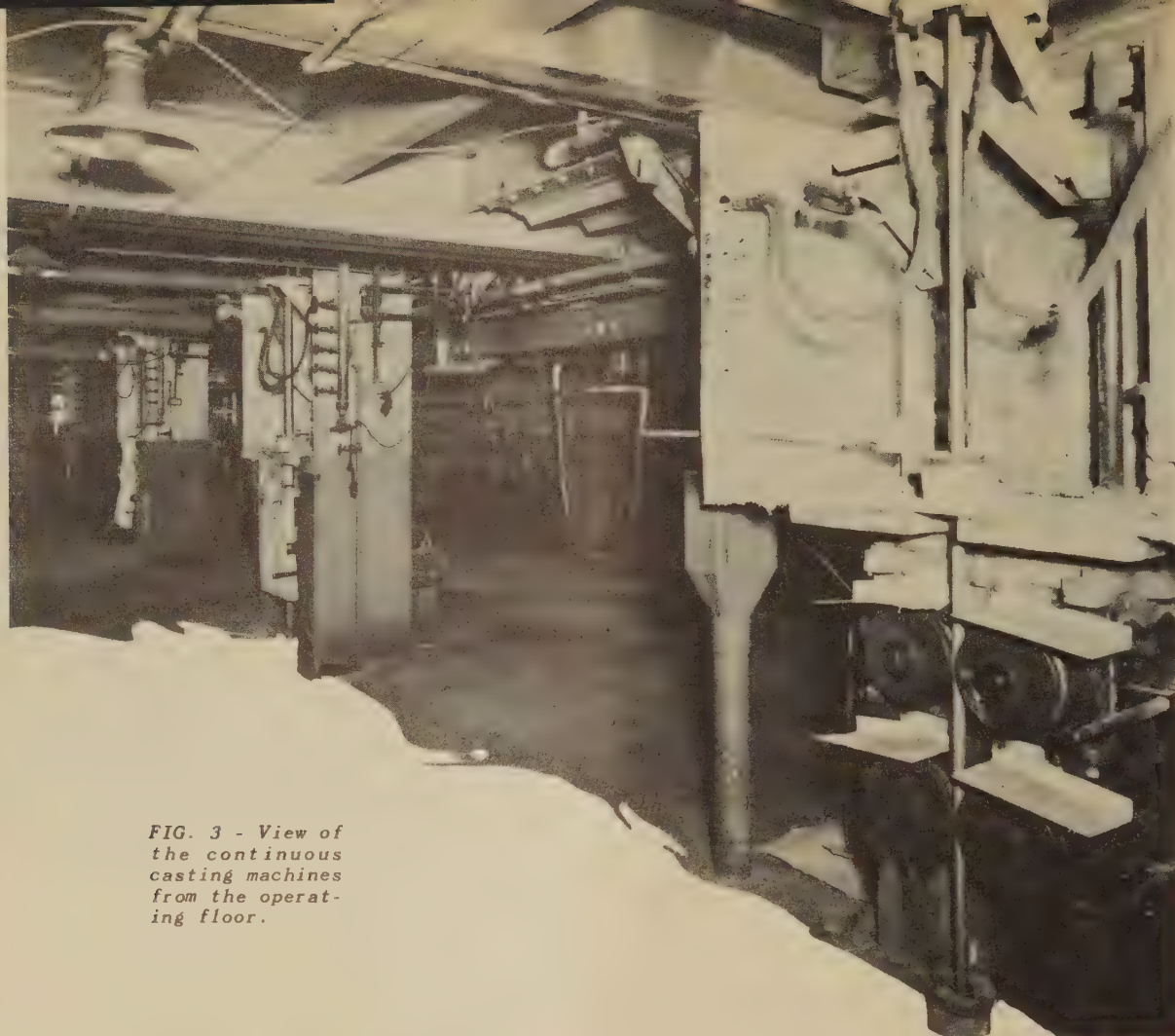


FIG. 3 - View of the continuous casting machines from the operating floor.

can be successfully maintained. However, the achievement of a constant metal flow to the mold becomes increasingly difficult as volume requirements decrease, and consequently, these processes are primarily employed to cast shapes for further processing having a minimum cross section of 16 sq. in.

The Asarco process used at this plant also employs a reservoir furnace to supply molten metal to a mold but the design and arrangement of the two are unique. There is neither a free falling stream of metal nor any need for a manually controlled feed. Instead, the mold or die is integrally connected to the bottom of the furnace and to the entire metal supply, and is fed by simple gravity flow as the solidified shape is withdrawn. Thus, the process is characterized by the absence of a free liquid surface within the mold or die which shapes the casting, the only free surface being in the casting furnace. This arrangement has such an important bearing on the size of the cross section that can be successfully cast commercially that rods having an area of less than 1 pct of the 16 sq in. previously mentioned are produced as standard products. As presently practiced, the Asarco process is engaged in producing sections varying from 0.14 to 16 sq in. It thus primarily supplements the size range covered by other methods.

The first commercial installation at the Perth Amboy plant of the American Smelting & Refining Co. was completed in 1937. This unit consists of four casting stands designed to produce 3 in phosphorus deoxidized copper billets of which over 300 million lb have been delivered to

the trade. Further experimental work has resulted in application of the process to the copper base alloy field. Methods have been developed for the production of tubing and special shapes such as squares, rectangles and hexagons in either solid or tubular form. In addition, means for casting rods in multiple have made possible the commercial production of sizes as small as 7/16 in. diam.

The introduction of such a multiplicity of sizes, shapes and alloy compositions necessitated major changes in equipment design to provide the necessary flexibility of operation. After several years' experience on a pilot plant basis, an entirely new commercial plant was constructed and brought into service in September 1947, for the production of alloy shapes. Its operations can best be visualized by reference to the essentials of the process in general.

Fig. 1 illustrates schematically the arrangement of the equipment. Molten metal is furnished by batch melting to a casting furnace equipped with a large crucible of sufficient size to accommodate variations in supply. A tortuous path (arrows) is provided to insure deoxidation and degasification, and to cushion the die (mold) chamber from sloshing effects during pouring. Metal enters the die chamber through one or more small drilled connecting passages and flows to the die by gravity. Upon reaching the jack-

eted length, very rapid solidification occurs; the excess sensible heat is extracted by means of additional secondary jackets where necessary and the casting proceeds through the roll drive governing the speed of withdrawal to the saw which cuts it to the desired length.

As illustrated, the equipment is arranged on four levels as the material flow is predominately vertical. Fig. 2 shows the layout of the melting and casting furnaces. Five of the six projected units for this plant are installed in operating position. Spare furnace shells, either undergoing repair or required for switching from leaded to nonleaded alloys, are also visible. Space is available in back of each melting furnace for the storage of a day's supply of loaded charge boxes which are prepared on the bottom floor and brought up by the crane. Using a movable dolly, the charge is wheeled to the furnace and chuted in by gravity through a hinged drop flap.

All melting operations are carried out in Detroit electric arc furnaces equipped with automatic hydraulic electrode feed and arranged for lip tilting. Due to the large variation in the dimensions of the products cast, three different melting capacities are provided ranging from 125 to 250 kw. The rocking action of the furnaces is very helpful in assuring proper mixing of the high leaded (up to 24 pct) bronzes and they provide a desirable degree of flexibility in changing from one alloy to another.

When the charge is at proper temperature, the melter removes a small cover from the receiving box attached to the casting furnace and pours the entire melt into the casting crucible via the launder connecting the two. He is provided with signal lights and a peep-sight so that under and overpouring can be avoided.

Among the functions of the casting furnace are those of providing the desired control of temperature and deoxidation and, above all, means for accommodating the die and supplying it continuously. The furnace shell is of welded construction and the cover is double-sealed in sand and oil to retain the nitrogen atmosphere which is supplied by a generating unit.

Thermal insulation is obtained from a lining of 3000° insulating brick. This contains a rectangular well for the crucible which is machined from a single piece of graphite and provided with a bottom opening for the die and a side opening for tapping out dry. Both openings are threaded and fitted with replaceable inserts containing the working threads that hold the die and the tap-out plug. Just above the top of the crucible, the brickwork is stepped back to provide a shelf upon which the resistors rest. A four-length grid of graphite electrodes is employed, entering and leaving on opposite sides of the furnace by means of water-cooled copper terminals. It is powered by a single phase alternating current supply carrying a transformer regulator for the necessary control.

The molds (dies) are machined from high density graphite and are used but once. They are fitted on the outside with mounting threads located somewhat upstream of center. Above the threads is a short extension which projects upward into the molten metal. Below the threads the die is tapered to accommodate the primary cooling jacket which carries a matching taper.

The inside surfaces are usually provided with one or more of a variety of tapers, the design of which depends largely on the alloy and shape being cast. Rod dies may contain one, two, three or five holes, depending on the size of the product and the quantity desired. Such arrangements call for special driving rolls and their use is a matter of economics. Tube dies are constructed on the principle of the bridge dies used in extrusion processes with the very important difference that the bridge is completely surrounded by molten metal. The rigid short-couple mounting of die and mandrel makes for unusually close control of wall thickness which generally varies in eccentricity by not more than ± 1 pct of its nominal dimension.

The fact that the mold is not constructed or assembled as an integral part of the jacket is an important feature of the process. This accomplishes maximum flexibility in the use of a large variety of die sizes and shapes in a standard series of jackets of much higher cost.

After a die and jacket are installed, the die opening is plugged with a starting rod which is strung through the rolls. Molten metal is then introduced and the roll drive started at a pre-

FIG. 4 - Closeup of an Asarco continuous casting operation.

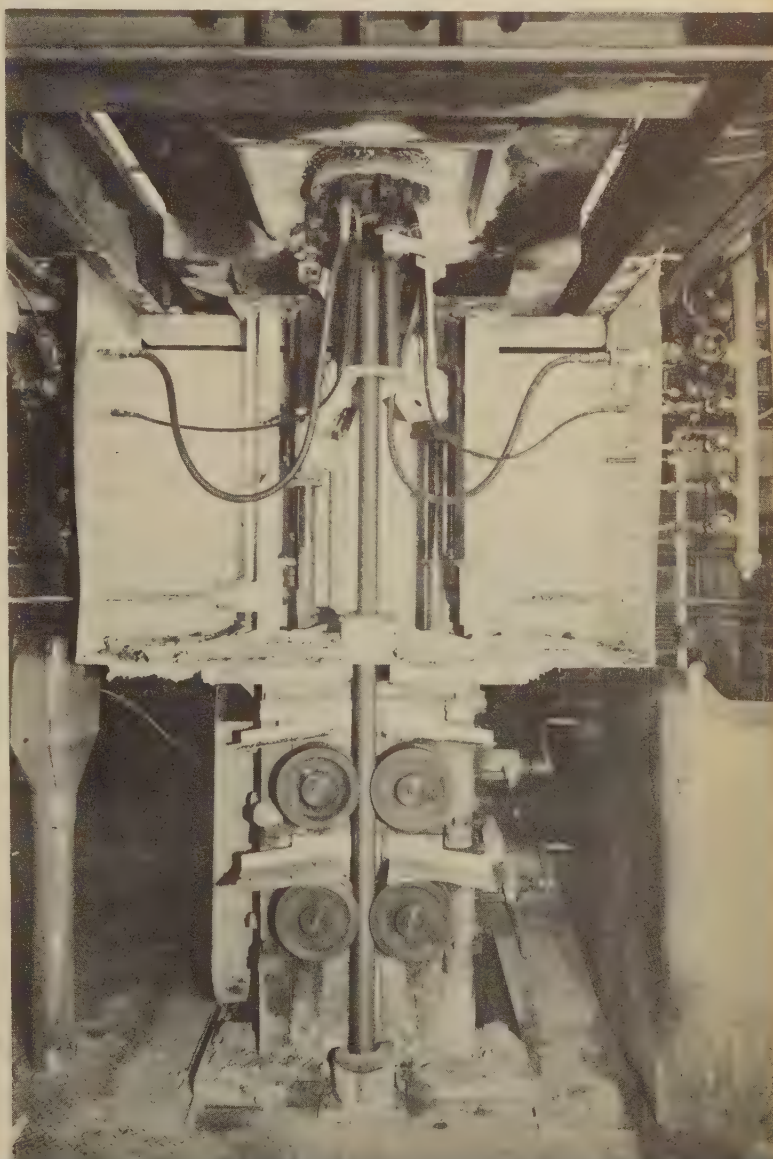




FIG. 5 - Saw floor where continuously cast bar is cut to length by saws which travel with the work during the operation.

determined speed, setting the casting cycle in motion, after which the speed is adjusted to the desired range. Fig. 3 shows the operating floor, and fig. 4 is a typical operation. The casting is seen as it emerges from the lower end of the die and jacket assembly, which is flush with the circular ring projecting from the furnace bottom (top of photograph). In this case, a single secondary jacket provides additional cooling for ease of handling. The operator controls the speed by a variable drive. The temperature of the casting furnace is controlled by varying the electrical input. The operator is provided with instruments on each stand which indicate or record the furnace and water temperatures, the pressure of the inert furnace atmosphere and the casting speed.

Visible in fig. 4 is a series of hose connections equipped with snap-on fittings for the purpose of supplying the primary and secondary water jackets. The water header is located to the right

of the shield and the top connection, with the large valve and large hose line, supplies the incoming water to the primary cooling jacket, which is exhausted on the left side of the photograph into a header which delivers it to the funnel visible at the left of the photograph. The four smaller nozzles below the main jacket supply are for the purpose of supplying any number of secondary jackets up to a maximum of four. In fig. 4, one secondary jacket is in place and can be seen about 2 in. below the bottom of the die. On small sizes of castings no secondary jackets may be required since the castings will emerge at a sufficiently low temperature. However, on large diameter work, particularly in the case of solid rods, two, three or four secondary jackets will be strung in position as required so that the work will not normally come off the rolls at a temperature higher than, say, 300°F.

After leaving the roll drive, the casting enters the saw floor (fig. 5) where it is cut to length by saws which engage the work and travel with it during the operation. Stand No. 2 is equipped with a fully automatic cut-off machine which is still experimental. All other units employ manually operated equipment using abrasive wheels for alloys over 2.5 pct tin content, and metal blades for the softer compositions. The work then drops into a tilting receiver and is rolled out into tables on the ground floor for inspection (fig. 6). All products destined for use as cast are finally finished by straightening on a Medart machine.

While, for practical reasons, a good deal of auxiliary equipment is required for successful operation, it is apparent that the die is the dominant factor in the process. Broadly speaking, die design, and the manner in which the die is utilized, are of prime importance; together they largely determine the mechanical and metallurgical characteristics of the products. Graphite is a die material of unusual caliber. Its thermal conductivity is very high, it is neither readily attacked nor wet by molten copper base alloys, it has excellent resistance to thermal shock, is self-lubricating when used as a die, and possesses outstanding machinability.

Furthermore, this combination of properties permits the top of the die to be submerged in the metal bath which results in important benefits to the casting. The entire bath functions as an ideal riser and, as a matter of fact, the feeding is so effective that no evidences of shrinkage have ever been found in the products. In addition, porosity is effectively eliminated by orderly diffusion of the gases liberated at the freezing zone up through the metal bath where their partial pressure can be controlled by the inert atmosphere of the furnace. A standard procedure of weighing the products has conclusively demonstrated that the densities are equal or superior to the calculated values for the various alloys. In fact, in the few cases where the density has fallen more than 2 pct below the theoretical value, the conditions were such that the process became totally inoperable.

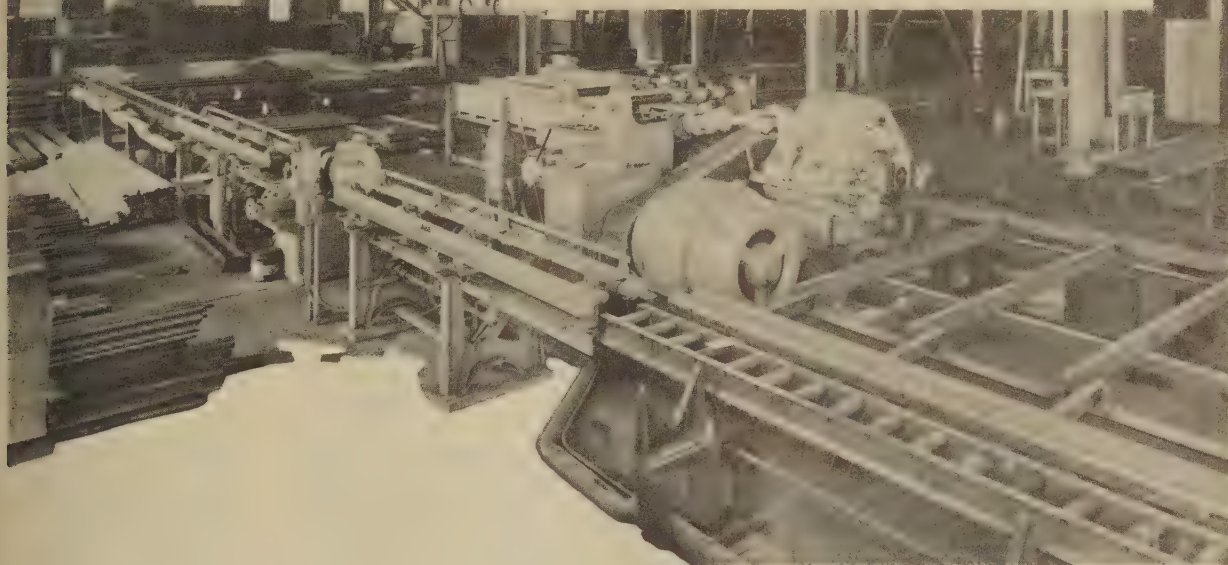
The "hot top" of the die further serves to assist in preserving the controlled superheat of the metal as it feeds downward to the solidification zone. Here, surrounded by a high capacity

TABLE I

Typical Physical Properties of Continuously Cast Alloys of the Fabricating Type

Alloy				Tensile Strength, psi	Elongation, pct in 2 in.
Cu	Sn	Pb	Zn		
95.0	5.0	0.0	0.0	46,000	70
90.0	6.0	0.0	4.0	45,000	80
92.0	8.0	0.0	0.0	55,000	30
88.0	2.0	0.0	10.0	33,000	95
94.5	4.5	1.0	0.0	42,000	68
88.0	4.0	4.0	4.0	42,000	40

FIG. 6 - Following the sawing operation, the cast work drops into a tilting receiver and is rolled onto tables on the ground floor, as shown here, for inspection.



jacket, it is solidified with an abruptness that can be classified properly as a quench. Naturally, the maintenance of such a short freezing zone goes hand in hand with efficient feeding and gas liberation, but the rate of chill necessary to accomplish it has a further bearing on the product. Since the path of heat extraction is primarily lateral, and turbulence is at a minimum, there is little impedance to columnar growth with the rather unusual result that a fairly large grain size is formed under conditions of high chill. This, coupled with the motion of the casting during solidification, yields a macrostructure having the typical chevron appearance shown in fig. 7, regardless of the metal or alloy being cast.

The effects of the chill are of much greater importance to the physical properties and the microstructure. Fig. 8 illustrates the microstructures obtained on the same series of alloys continuously cast, permanent mold cast and sand

cast. Commercial usage has confirmed the superiority in quality that would be expected from the improvements in the fineness, degree, and uniformity of the dispersion of secondary constituents, and the freedom from segregation that the process affords. Table I lists the physical properties obtained from a number of production runs on typical alloys shipped to brass mills for fabrication to finish dimensions. The data given are average figures based on 15 or more determinations, and represent a variety of sizes and shapes. The unusual soundness, malleability and ductility of continuously cast stock has resulted in substantial increases in the ratio of finished weight to cast weight in leaded bronzes. As compared with the normal experience of 50 to 60 pct finished product, brass mills have reported yields of 80 to 90 pct with continuously cast stock, the upper range being realized on material not scalped during the processing. In addition, the

FIG. 7 - Typical chevron appearance of continuous cast copper base alloys. 1½X; etchant (NH₄)₂ S₂O₈.

88-10-0-2: 1¼ IN. ROD

85-5-5-5: 1 1/8 IN. ROD

83-7-7-3: 1¼ IN. ROD

75-5-20-0: 1¼ IN. ROD

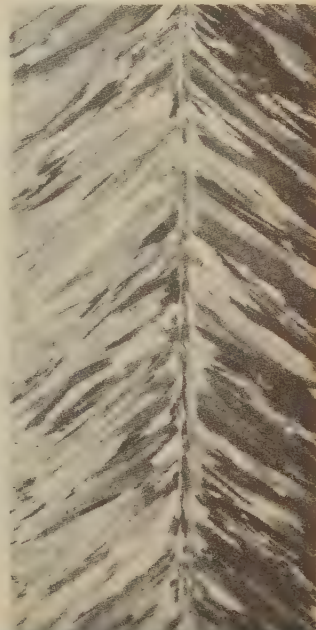
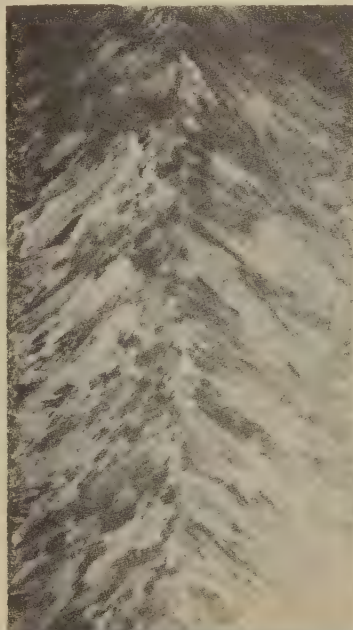
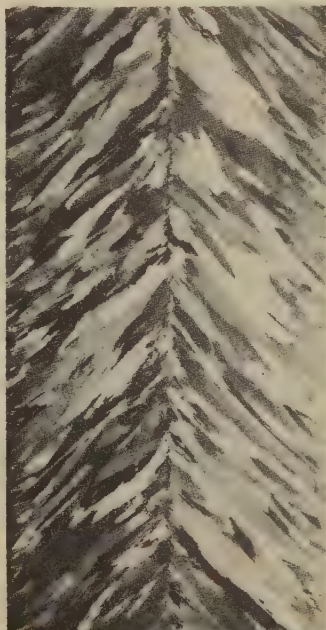
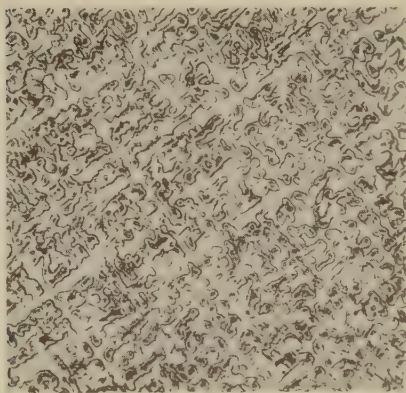
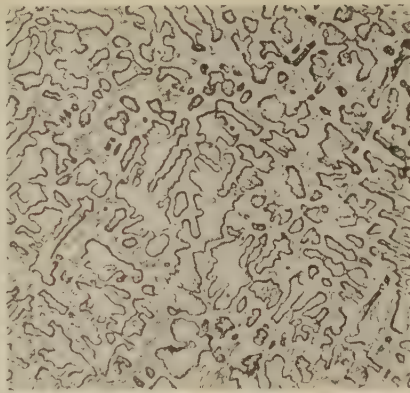


FIG. 8 - Comparison of microstructure of various copper base alloys in continuous cast, permanent mold and sand cast form. 200X; etchant $\text{NH}_4\text{OH} + \text{H}_2\text{O}_2$ and $\text{K}_2\text{Cr}_2\text{O}_7$.

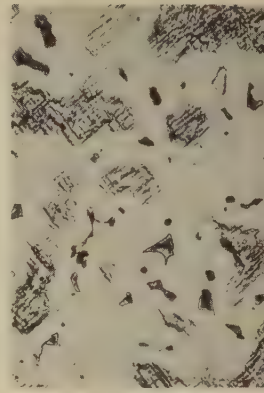
ALLOY 88-10-0-2



CONTINUOUSLY CAST

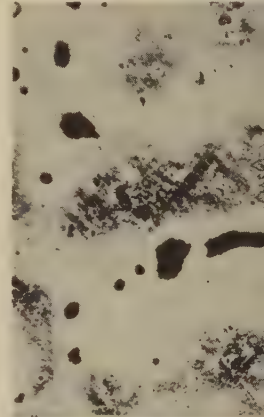
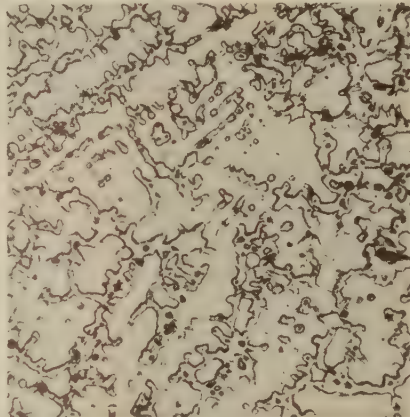
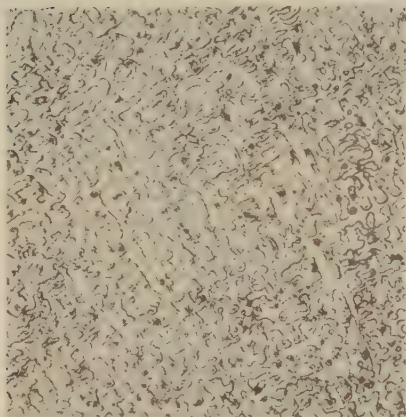


PERMANENT MOLD

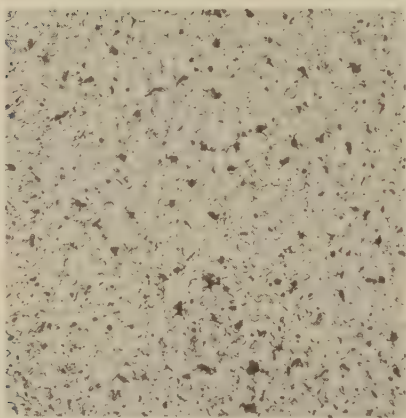


SAND CAST

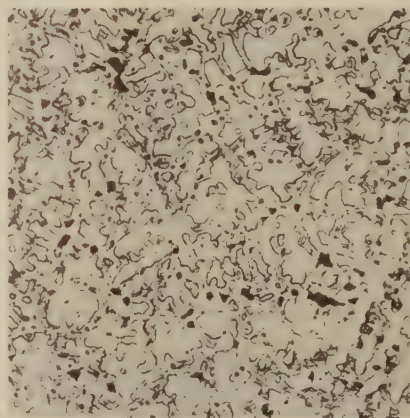
ALLOY 85-5-5-5



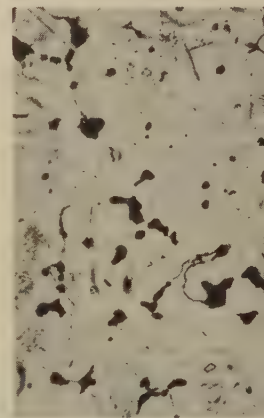
ALLOY 83-7-7-3



CONTINUOUSLY CAST

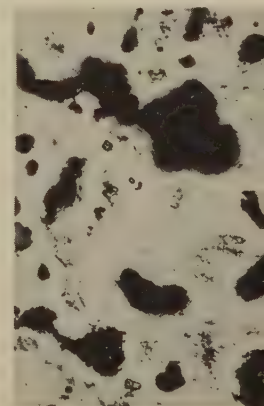
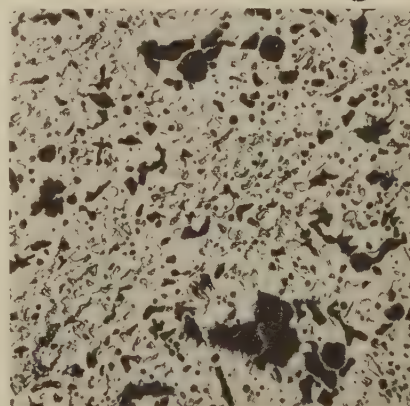
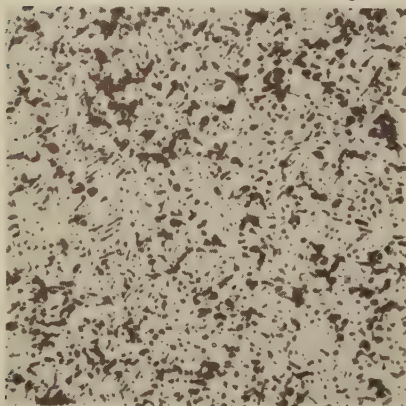


PERMANENT MOLD



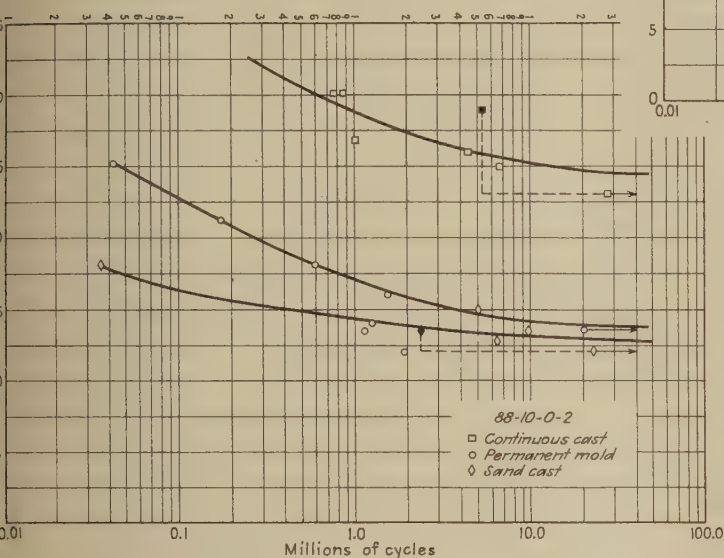
SAND CAST

ALLOY 75-5-20-0



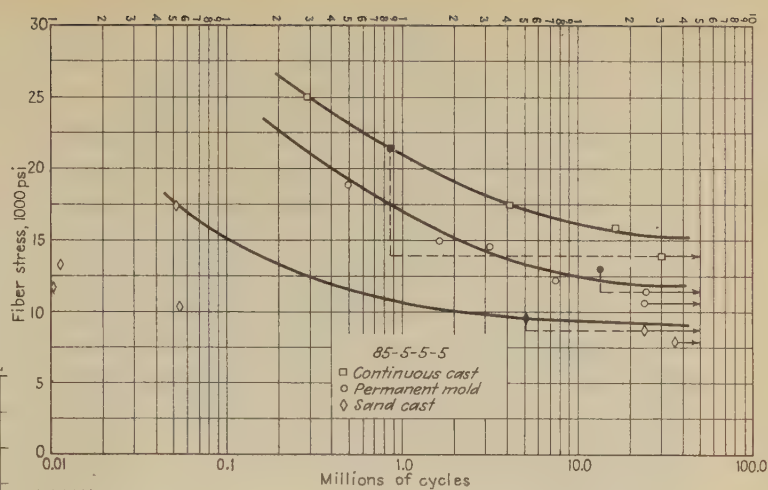
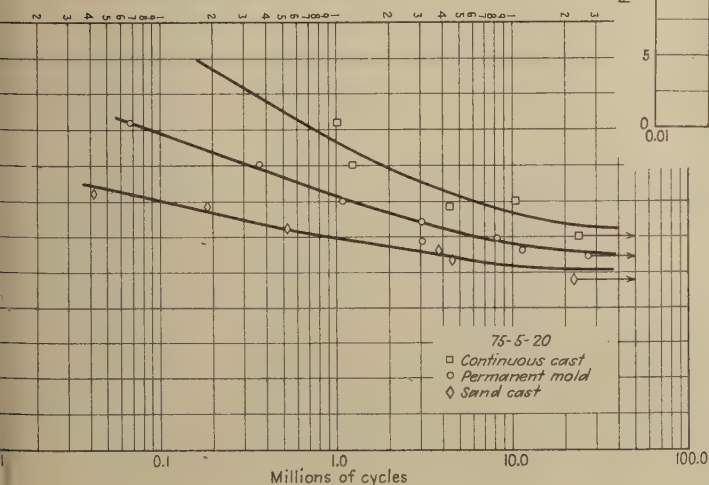
problem of homogenizing anneals is greatly simplified; the delta constituent in a 10 pct tin bronze can be wholly absorbed in continuous castings during a 1-hr anneal at 700°C (1292°F) as compared to the 24-hr period that may be required for castings made by other methods.

The question of whether a good casting is more important to a fabricating mill than to a machine shop is debatable, but there can be no doubt that to machine a defective casting usually



produces an expensive piece of scrap. Hence, the outstanding physical properties of continuously cast shapes in the foundry alloys are of equal practical importance. Table II lists comparative tensile data for the previously described alloy series in the form of continuous, permanent mold and sand castings. All samples were machined to 0.505 in. diam from 1 in. bars. It will be noted that the tensile and yield strengths and the Brinell hardness are beneficially affected by increasing rates of chill. As would be expected, elongation and reduction of area are proportionately lower, but entirely ample for service requirements.

In general, the increase in properties and, in



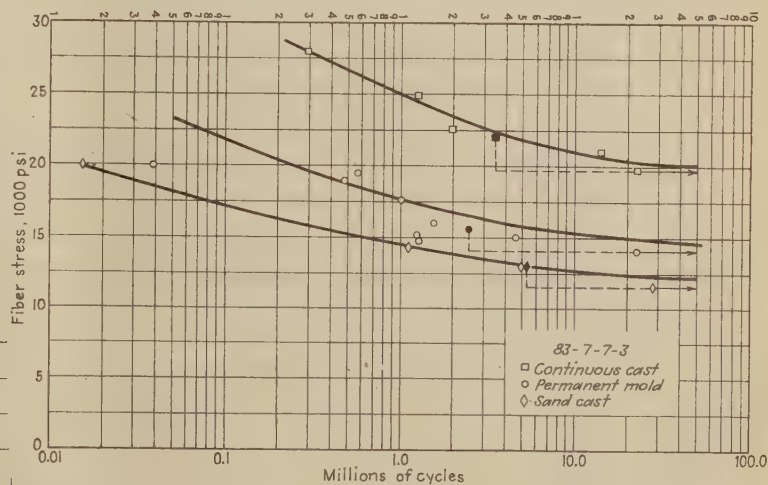
ABOVE

FIG. 10 - Fatigue characteristics of the 85-5-5-5 alloy in continuous cast, permanent mold and sand cast forms.

LEFT

FIG. 9 - Fatigue characteristics of the 88-10-0-2 alloy in continuous cast, permanent mold and sand cast forms.

particular, the yield strength, for bronze alloys of low lead content (less than 5 pct) obtained from continuous castings is in the neighborhood



ABOVE

FIG. 11 - Fatigue characteristics of the 83-7-7-3 alloy in continuous cast, permanent mold and sand cast forms.

LEFT

FIG. 12 - Fatigue characteristics of the 75-5-20 alloy in continuous cast, permanent mold and sand cast forms.

TABLE II

Physical Properties of a Series of Foundry Alloys Cast by Three Methods

Alloy Cu-Sn-Pb-Zn	Type Casting	Tensile Strength, psi	Yield Strength, psi	Elongation, pct in 2 in.	Reduction of Area—pct	Brinell Hardness
88-10-0-2	Continuously cast	51,500	33,700	12	11.2	96
	Permanent mold	51,600	26,500	14	10.5	83
	Sand cast	48,400	21,600	42	37.2	63
85-5-5-5	Continuously cast	45,000	21,400	28	21.4	72
	Permanent mold	41,200	19,500	24	21.4	65
	Sand cast	36,400	16,900	35	36.7	49
83-7-7-3	Continuously cast	44,000	27,000	16	13.5	72
	Permanent mold	41,600	21,900	18	17.8	72
	Sand cast	40,400	19,500	39	28.0	65
75-5-20-0	Continuously cast	28,700	22,800	8	6.6	57
	Permanent mold	29,600	18,200	12	14.1	57
	Sand cast	26,900	15,800	17	18.9	45

of 15 to 20 pct as compared with sand castings. This will be welcomed by designers, and quite naturally, initial considerations will probably be directed to standard applications and particularly those with severe service requirements.

There are numerous cases, however, where the end uses are such that it would be advantageous to consider the possibility of obtaining sand cast physicals by continuously casting alloys with proportionally lower tin content. Aside from the important consideration of conservation of tin, the reduction of 1 pct tin in an alloy composition lowers its cost by about $\frac{3}{4}\phi$ per lb in today's market.

In addition, there are other benefits of consequence, irrespective of lead content. Fatigue tests on the same series of alloys are reported in figs. 9 to 12. Here again, the permanent mold castings are intermediate, with continuously cast materials excelling the sand cast alloys by 25 pct in the case of a low tin-high lead composition and by an increase of 90 pct in the high tin bronze. Moreover, the increases in impact strength shown in table III are equally impressive. Both of these properties are of fundamental importance to bearings, bushings, gears and other structural parts where service requirements are severe. Consequently, it would be entirely normal to expect a steadily increasing number of applications for these products due to their fatigue and impact properties alone. As a matter of fact, the subjects of impact and fatigue in the cast bronzes are not treated too plentifully in the literature, and those who have tried to obtain experimental data will be among the first to note the substantial uniformity in behavior of the

continuously cast alloys as compared with the wide scatter that is normally obtained from bronzes cast by other means. In this connection, the results of machining several million pounds of continuously cast bronzes has indicated a rejection rate for casting defects of less than 0.1 pct.

The ability of the process to produce all the products within its scope in the form of mill lengths has been a major factor in its growth to the commercial stage. Fabricating mills can now procure basic castings in sizes and lengths best suited to their processing equipment. Similarly, screw machine lengths are now available to machine shops in the foundry bronzes, bridging the gap between the economies of these automatic machining operations and the lack of suitable bronze shapes.

At the present stage of development, continuously cast products are being produced within the following alloy limitations:

Cu	65 pct min
Sn	13 pct max
Pb	25 pct max
Zn	10 pct max
Ni	5 pct max

Shapes are available as follows:

Rods:	7/16 to 4 1/4 in. diam, min to max
Tubes:	1 to 4 1/4 in. OD min to max 1/2 in. ID min 3/16 in. wall min
Rectangles:	1 to 4 in. wide 3/4 to 1 1/8 in. thick corner radii—1/4 in. approx.

Sizes on other forms vary with the shape; size limitations also vary somewhat with the alloy.

All products for machining are furnished straightened and within a general tolerance of ± 0.004 in. on the OD. Tube concentricities are ± 0.006

within 1.5 pct of the wall thickness which is controlled to permit cleanup of the ID. with a 1/64 in. cut.

In common with all casting procedures, the Asarco process for continuous casting is actually a scientific art. The background of the operating knowledge and experience available today is the result of significant contributions on the part of at least 20 individuals, and is thus a representative product of modern organizational research.

TABLE III

Impact Tests
(ASTM E23-41T Type Z)

Alloy	Ft Lb Continuously Cast	Ft. Lb * Sand Cast
88-10-0-2	25.5	8.7
85-5-5-5	20.7	12.0
83-7-7-3	12.5	9.3
75-5-20-0	6.2	5.5

* Machined from 1/2 in. diam bars—average of three determinations.

Giant German Gear Hobs

GIANT hobs, such as shown in the accompanying illustration, were found in Germany following the war and sent to David Brown & Sons, Ltd., Huddersfield, England, for examination. A Pfauter hobbing machine, designed to use these hobs, was also acquired for testing the hobs.

Findings of this examination, as reported by David Brown & Sons, are as follows: The spindle on the German hobs was $3\frac{3}{16}$ in. diam; one hob was of 4 DP and the other 10 DP, and each was about 10 in. diam. The teeth were inserted into the body of the hob in dovetail fashion. End-face driving slots were provided in the body instead of the orthodox keyway in the bore. The rows of teeth were made in wedge form and driven into correspondingly tapered slots machined axially in the hob body. The hob metal was high speed steel.

Two nickel steel gear blanks were hobbled. The blanks were 13.4 in. diam, with a 6.15 in. face, the maximum face width that would insure complete entry and runout for the hob. The gear tooth finish was poor, owing to the severe vibration of the vertical head of the Pfauter machine. The vibration was of an order of 0.007 in. forward and 0.003 in. sideways. Hob speed was 65 rpm, feed was 0.06 ipr, and cutting speed was 170 fpm. Feed motion of the hob saddle was opposite to the hob motion, and the action was that of climb milling. It was obvious that hob efficiency was adversely affected by the unsatisfactory performance of the machine.

A special work arbor and a steady bracket were attached to a fixture mounted on the vertical head and further cutting tests were made. Hob speed, feed, and cutting speed were the same as in the earlier trial, and the initial roughing cut was followed by a 0.010 in. deep finishing cut. When the hob had traversed halfway across the gear blank in the finishing cut, the machine was stopped to inspect the tooth finish. The finish of the rough cut surface on the upper half of the



FIG. 1 - This German giant hob is shown with a David Brown hob of similar pitch. Tests indicate that only special purpose jobs can be cut advantageously on the giant hobs.

blank was better than the finish cut surface and both were far superior to those obtained in the first test.

A series of cutting tests to determine the cutting properties of the hob was halted after cutting three blanks, 57, 53 and 50 teeth, respectively, because of obvious signs of distress. The hob was sharpened because worn bands at the tips of the teeth proved to be 0.020 in. wide and the top faces of the teeth were indented near the cutting edge at the ip. After sharpening, a repeat test was made and a worn band 0.015 in. wide developed on the most active teeth.

From the series of tests, it was calculated that performance of the giant hobs under climb cutting conditions could be summarized as follows:

- 1—Rotary speed of the hob, 65 rpm.
- 2—Cutting speed, 170 fpm.
- 3—Feed per revolution of work, 0.060 in.
- 4—Hobbed tooth length, $9\frac{1}{2}$ ipm.
- 5—Life of hob between sharpening, $8\frac{1}{2}$ hr.
- 6—Finish produced on work, good.

Investigations indicate there is no evidence that giant hobs are appreciably superior to a hob of normal size run at the same cutting speed, although it may be expected to have a proportionately longer life between sharpenings because of its greater number of cutting edges. It is more expensive, and each resharpening reduces its value by an amount proportionately greater than in the case of a normal hob.

Iron Ore Crushing

Despite the greater capital outlay involved and the complications to the flow of material, the use of stage crushing for iron ore may prove of value in many respects, it is reported in the article "Crushing Iron Ore," published in the Iron and Coal Trades Review (London), July 23, 1948.

The article, by D. D. Howat, of the Royal Technical College, Glasgow, cites as among the advantages of stage crushing a reduction of the quantities of fines produced, reducing the ton-

nage of ore to be sintered, and ensuring smoother operation and increased production of the blast furnace.

This article explains in considerable detail the theoretical considerations of ore crushing and touches, in particular, on such subjects as efficiency of crushing machines, the relationship between useful work and size reduction, characteristics of fracture in brittle solids, particle size distribution v. the design of crushing mills and effect of size reduction on crusher characteristics.

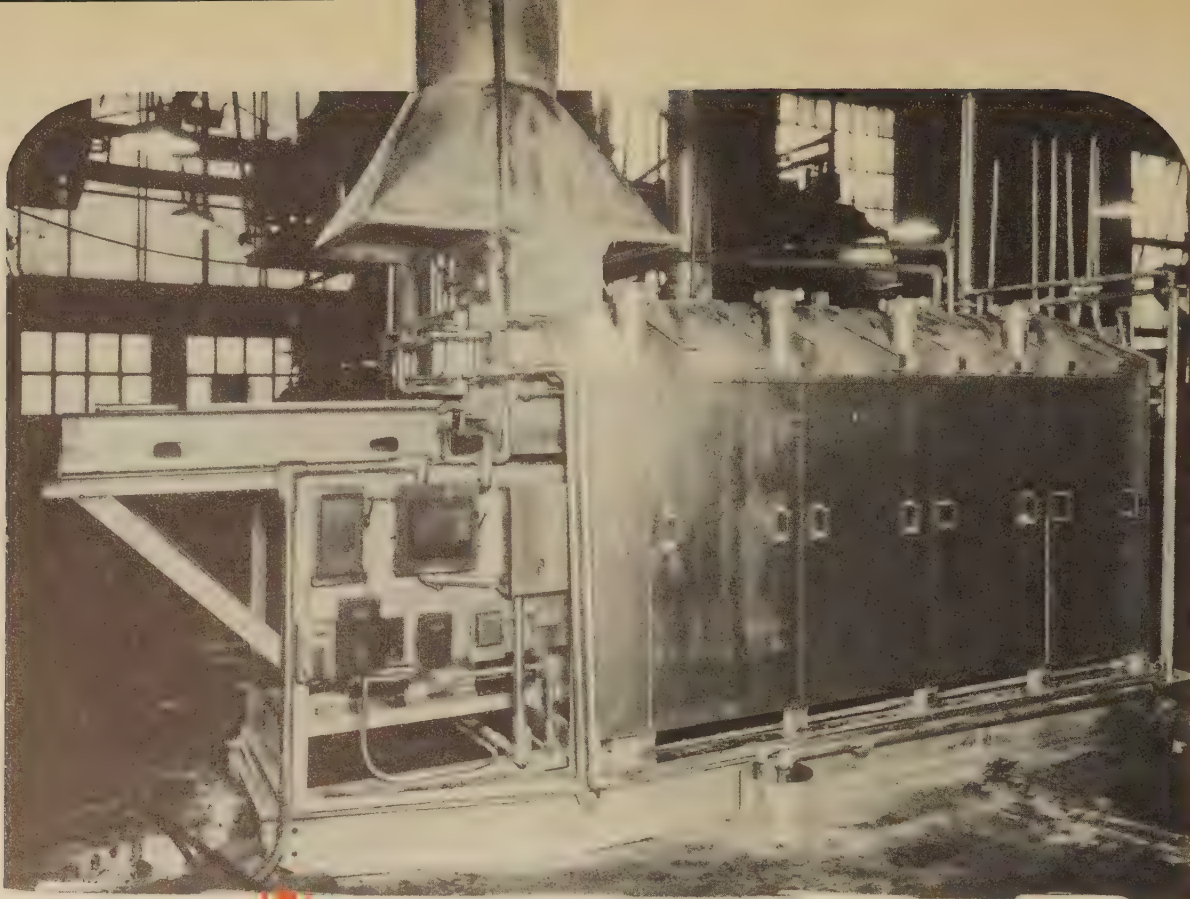


FIG. 1 - Sideview of SC rapid billet heater showing top of furnace heater tube, enclosed lower sections containing piping and controls, and the pusher type charging unit.

A newly developed forging billet heating furnace which heats work to 2200° to 2300°F at a rate of up to 440 pieces per hr with a minimum of oxidation is described in this article. Containing a number of unusual design features, including water-cooled skidway rails, the furnace is said to have a normal refractory life. Construction, heating rates, atmospheres, controls, operating costs and furnace life are discussed.

By L. J. STANBERY and J. M. BRENNAN
Consultant and General Manager, respectively,
Drop Forge Div.,
Willys-Overland Motors, Inc.
Toledo

WHILE gas has been used for high speed heating for some years, it has been applied largely to heating small or thin pieces of material as a part of the heat-treating process. Heating of larger masses of steel, such as thick bars, billets or rounds, with a minimum thickness or diameter of 1 in., and ranging up to several inches, especially where forging temperatures are desired, has been considered a relatively slow process. The wider difference in temperature required between the combustion gases and the pieces undergoing heating to shorten the heating time, necessitates furnace temperatures well above those ordinarily used. Rapid deterioration of furnace linings, skidways and other internal furnace parts due to the high temperatures has been assumed to place limitations on the process from the standpoint of maintenance and economy of furnace operation. Serious oxidation of the surfaces of work pieces, as well as furnace parts, has been considered unavoidable unless a prepared atmosphere is employed.

That these problems have been overcome and several additional advantages obtained, is now proved by the new gas-fired billet heating furnace developed by the cooperative efforts of

Rapid Billet Heating

With Gas

metallurgists and engineers of Willys-Overland Corp.'s Drop Forge Div., and Surface Combustion Corp., both of Toledo, Ohio. Not only are the billets heated to forging temperature in a matter of minutes, with practically no surface oxidation, but furnace life has been shown to be entirely normal.

To attain these results the adoption of numerous unconventional features of furnace design has been required. Unusual methods are used to obtain high furnace temperatures, to transfer heat as rapidly as possible to the billets, to control the heating cycle to prevent overheating, the form of furnace used, the ceramics employed, the method used to prevent deterioration, even melting of the skidways, and to minimize oxidation. Additional unusual characteristics include the flexibility of the furnace in its ability to handle pieces of various sizes and shapes, with either a minimum or no lost time for changeovers, the rapid furnace firing-up time, the relatively low initial cost of the equipment and the small floor space required.

Externally the billet heating furnace, shown in fig. 1, represents a compact, or "packaged" appearance. All space under the furnace proper has been utilized for the placement of burners, controls, etc. This space is largely covered by steel panels. The discharge end of the furnace, shown in fig. 2, is similarly sealed off, with panels and hinged doors also covering the opposite side.

The furnace proper is a cylindrical ceramic

FIG. 2 - View of the discharge end of the billet heating furnace which illustrates the cylindrical shape of the unit. Note downward sloping water-cooled skid rails.

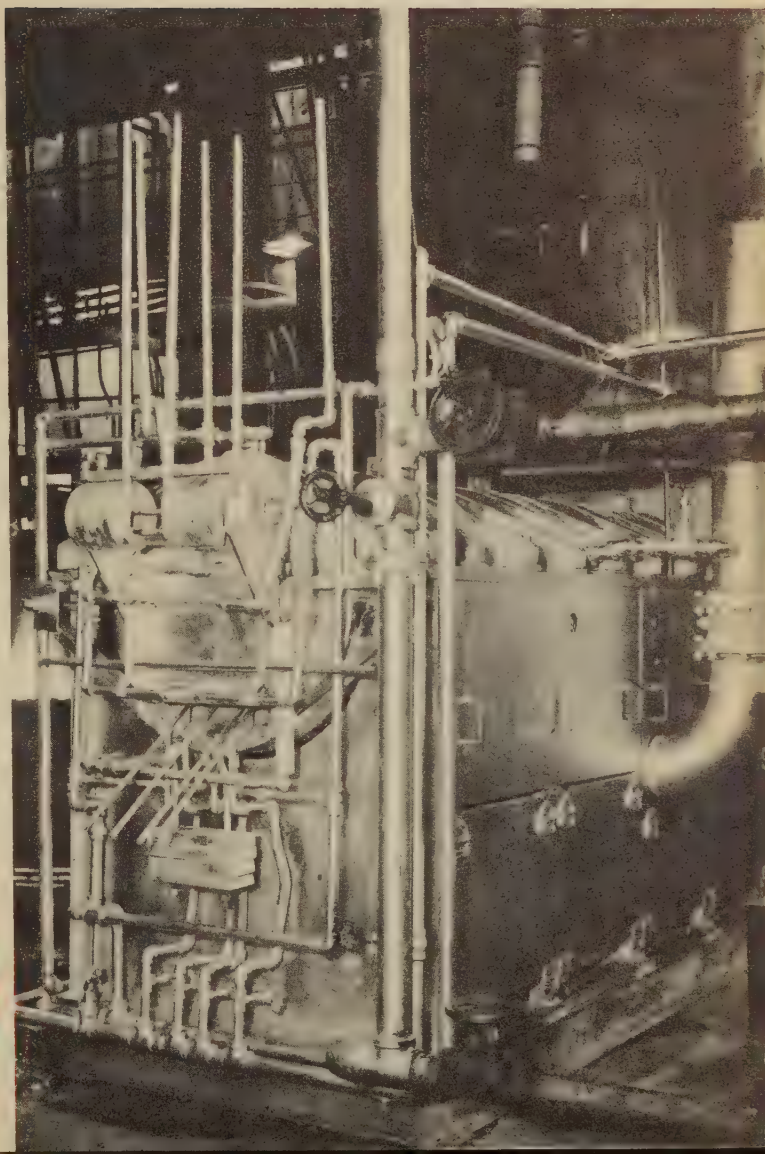
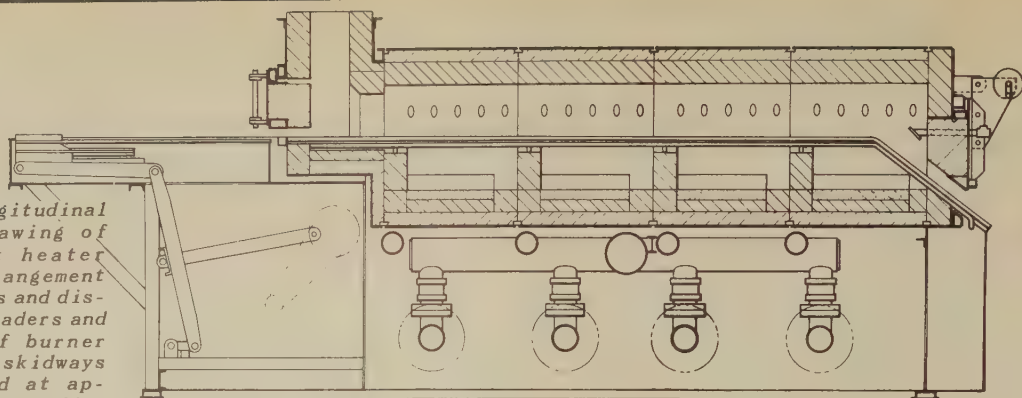


FIG. 3 - Longitudinal section drawing of the billet heater showing arrangement of manifolds and distribution headers and location of burner ports. The skidways are located at approximate centerline of the furnace.



lined steel tube approximately 21 in. ID, and 9 ft 6 in. long (see fig. 3). Forty burners are arranged 20 per side in four groups of five. The burners enter the tube approximately tangentially, producing a rotating or whirling action of the flames within the tube. Thus the hot gases do not impinge directly upon the work pieces. The work is carried through the furnace at the approximate center of the tube, but tends to remain close to the inner wall of the tube. The tube centerline is approximately 4 ft 6 in. from floor level.

Charging of the billets into the furnace is accomplished by means of a pusher mechanism located on a table at skidway height. As with the furnace piping and controls, the pusher driving mechanism is mounted underneath the charging table below the furnace tube and is also enclosed. Use of this method of charging increases the overall length of the furnace "package" to 13 ft 6 in. The pusher is of such design that it can accommodate pieces of different width and length and charge them at any desired time interval.

Discharging is accomplished simply by having the skidways bent downward near the discharge end of the tube, so that a billet drops or slides out of the furnace each time a cold billet is pushed into the charging end.

While the total time each billet is in the furnace is now limited to 6 min by the trim press rate of operation, it can be reduced to 4 min when subsequent forging operations can be performed more rapidly. The 6-min heating time permits a billet discharge rate of one each 10.7 sec or 336 per hr. The rate can, therefore, be increased to 440 per hr with the 4-min heating up time. The temperature of the billets ranges from 2200° to 2300°F, as desired, for either round, square or flat billets which may be used interchangeably without altering the skidway rail spacing. Billet dimensions may range from a diameter or thickness of from 1 to 2.5 in. for rounds, squares, or flats with a length up to 10 in. Since the maximum stroke of the charging pusher is 12 in., the width of the flats may be any dimension less than this figure. The flat billets used for tractor link forgings, one of the regular operations for which the furnace is employed, are approximately 1x4x9 in. The material is SAE1040 steel.

The short heating cycle (4 to 6 min in furnace), in combination with the nature of the

atmosphere surrounding the billets while in the furnace, results in negligible scaling. At the moment the billet reaches the forging press, the scale is believed to be approximately 0.002 in. thick, one-half of which is attributed to air scaling from the time the billet leaves the furnace until it is struck by the forging dies.

Since die life is the major item in forging cost and often justifies a large difference in heating equipment cost if die life can be increased, it is noteworthy that the life of the dies used when the billets are heated by the gas-fired furnace is of the same order as when heated by induction, that is, from 17,000 to 18,000 forgings per pair of finish dies. Die life in this range is vastly greater than when billets are heated by older slow heating box or slot furnace methods. A further factor is the uniformity of temperature of the billets when heated in the gas-fired billet heater, as compared with older methods. In fact, forge operators have expressed a preference for billets heated by this furnace due not only to uniform heating, but possibly also to the slightly higher billet temperature obtainable without endangering the heating equipment.

The high furnace temperature and virtual freedom from billet oxidation are the result of unusually close control of the air-gas mixture ratio and the method of supplying the mixture to the burners and furnace. The gas is completely pre-mixed before it is supplied to the two manifolds, one on each side of the furnace tube. The mixture is then forced to manifold headers for each section of the furnace. Individual tubes lead from the manifold headers to each burner. The arrangement is such that in effect the furnace is sectionalized into four separate furnaces, each with short mixture lines and separate temperature controls. The air-gas mixer is of the same type as the balanced pressure proportioning device used in Surface Combustion NX prepared atmosphere generators. Regulation is sensitive to gas pressure changes of 0.05 in. water column. Mixture pressure entering the manifolds is 2 psi. Pressure within the furnace tube is comparatively high, so that air infiltration into the tube cannot occur. Such infiltration would offset the rate of oxidation of the work pieces. No fire checks are used in the entire manifold system. A vertical back-fire header extends upward from the mixer, over the end of which a diaphragm is placed. With this arrangement no backfires even sufficient to damage a

pressure gage have occurred and no burner tips have been damaged.

The burners consist of ceramic tips mounted in metal holders firing into ports in the brick furnace chamber. For starting up, the burner valving is so arranged that two burners at the end of the furnace may first be ignited separately. The burners and control system may be adjusted to handle natural gas, the normal supply for the Willys-Overland Commercial Forge plant, or to use coke oven gas in emergencies. Oil standby equipment also can be installed if necessary.

The rapidity with which high temperatures may be reached is indicated by the fact that the furnace may be heated to 2500°F within 15 min from initial ignition of the end burners, while the maximum temperature of 2700°F may be attained in 1 hr.

To minimize heat losses and thus attain and maintain the high furnace temperatures noted, all sections of the lining are at least 7 in. thick. Sections exposed to maximum temperatures are lined with a special alumina brick containing no chromium or magnesite. These sections include the casing or tube, the casing ends, the charge door, a portion of the exhaust stack and the mountings for the skidway rails.

Obviously the high furnace temperature would quickly melt the skid rails unless some means of continuous cooling were provided. This is accomplished by a closed water-cooling system, the rails being ordinary pipe through which the water is rapidly circulated. The use of a closed system was decided upon initially to prevent the accumulation of scale within the rails over a period of time, such as would occur if city water were passed through them continuously. Thus no water treatment is required, since only a small initial deposition of scale can take place.

The water is circulated at a high rate through the four rails. Cooling of the circulated water is by means of city water in a heat exchanger located above the furnace assembly. The circulating pump is also located above the furnace assembly. The cooling water used, after passing through the exchanger, may be used for other purposes in the plant. If such uses prove undesirable, the installation of a cooling pond has been suggested, with the cooling water recirculated in the exchanger in the same manner as in the closed system. Pressure in the closed system is maintained at 65 psi. An expansion tank with makeup supply float maintains a pre-determined water level for the circulating pump.

To prevent melting of the skid rails in case of electric power failure, normally closed solenoid valves in the lines from the pump to the heat exchanger open to admit city water directly to the rails.

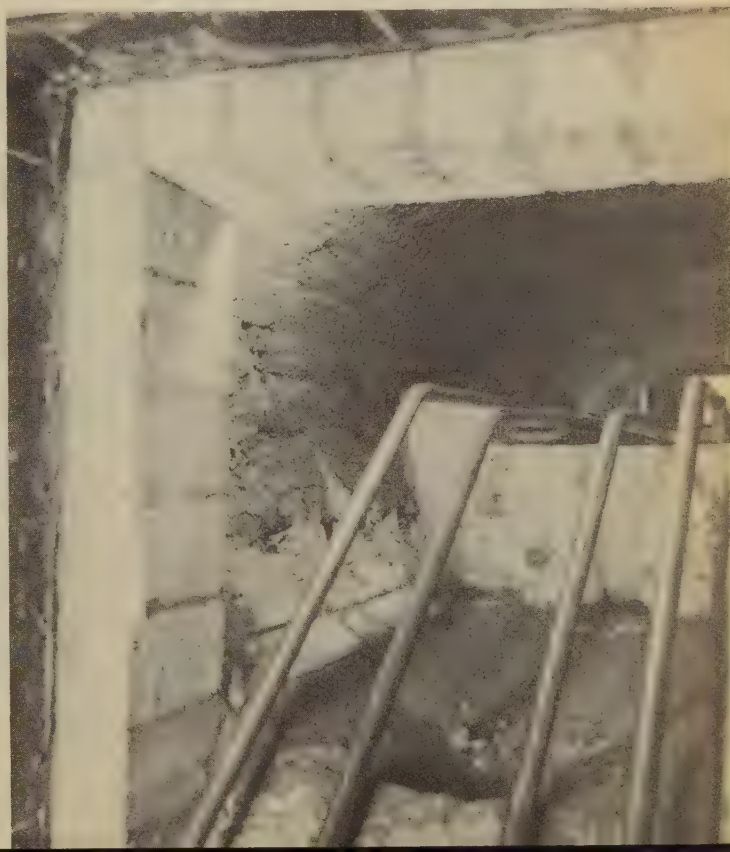
In addition to the solenoid controls which act on the water cooling system, several others either of a protective or operational nature are provided. Should the water circulating pump be intentionally stopped momentarily for any reason, only enough city water to prevent the rails from becoming overheated is admitted to the closed system. Should the supply of air for combustion become low, due to failure of power to the blower or for any other reason, the gas supply will be immediately cut off. This also takes

place in case of water pump stoppage due to power failure, or if the furnace temperature goes above the set maximum.

Due to the unusual design of the furnace, and the newness of its application, accurate costs have been kept during both the initial or experimental stages and the actual operating stages of its development. The initial or equipment cost of the furnace complete (1947 costs) ranges between \$7.00 and \$10.00 per lb per hr of productive capacity. This compares with from two to four times this range for any other heating method, if all necessary equipment is included. Gas consumption at the 10.7 sec billet delivery rate is 5000 cu ft per ton of billet weight, using 1050 Btu gas. With the tractor link die cost at \$800, the die cost per forging is 5¢ per link, virtually the same die cost per piece as for heating by the induction method. This cost is about a third that of a conventional oil or gas-fired furnace. The fact that this rapid heating furnace produces a softer scale is also a factor, since the amount of necessary die polishing is reduced. With either the faster heating rate (4 min) or a larger furnace, both initial and operating costs should be further lowered. Forge press operators state that the billets are just as uniformly heated as by any other method and that temperature control is just as precise.

Examination of the furnace lining after operation from September 1947 to January 1948 (nearly five months), when gas shortages forced a shutdown, showed no need for any replacements or repairs (see fig. 4). Minor abrasive wear on the skid rails indicated the desirability of applying a hard surfacing material to the center pair of rails. Relocation of the furnace to place it closer to the forging presses is also contemplated both to reduce air scaling and to improve the production rate.

FIG. 4 - Interior of furnace chamber after extended operation period. Note the good condition of lining and skidway rails. The furnace was returned to service without lining replacement.



Producing the Seeburg

By T. E. LLOYD
*Machinery Editor,
The Iron Age*

THE design of the Select-O-Matic "200" Library, an automatic record changer recently introduced by J. P. Seeburg Corp. imposes several basic demands: Light weight, strength, a minimum of maintenance, and vibrationless operation. In meeting these demands, Seeburg engineers exploited to an impressive degree the potentialities of diecastings and power metallurgy. The carriage mechanism, fig. 1, makes use of 41 diecast parts and 11 powder metallurgy parts. The latter are shown in fig. 2. Of the diecast parts, 25 are aluminum and 16 are zinc. These parts range from the fractional-pound items to the aluminum main base housing, fig. 3, and the 4½ lb zinc record turn-

table, fig. 4.

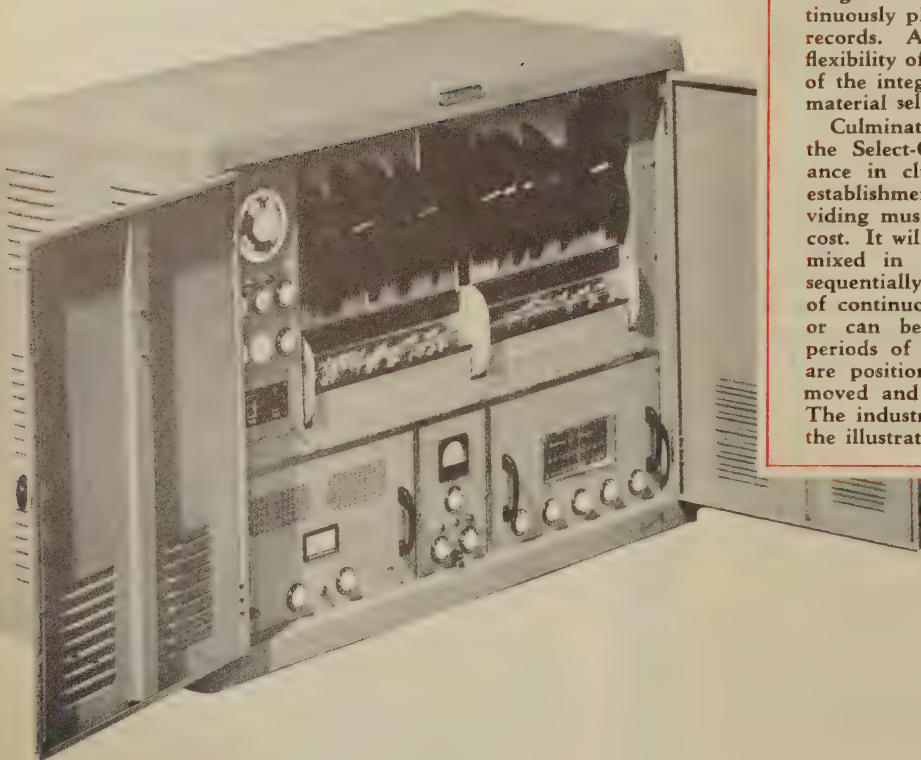
The pressed metal parts are all in iron and are all oil impregnated with SAE 20 oil, the impregnating being done cold by soaking the parts in oil for 20 hr. One precision investment casting, in Navy Bronze, is used in a heavy wear application. Some wrought steel parts are also used, particularly in the gear box. The variety of materials used in the record library is illustrated in fig. 5, a diagram of part of the unit.

In designing the gear box, where iron powder, Bakelite and steel gears are used, Seeburg engineers were guided by the maxim of never running an iron powder gear against another iron powder part. Polished steel gears are run be-

—About the Seeburg Select-O-Matic "200" Library:

Heralded as an outstanding development in the entertainment field is the recently introduced Seeburg Select-O-Matic "200" Library capable of continuously playing, in a vertical position, up to 100 records. Almost human in the complexity and flexibility of its functions, it is an excellent example of the integration of effective design and effective material selection.

Culminating about 9½ years of development, the Select-O-Matic has found immediate acceptance in clubs, industrial plants and commercial establishments as a means of economically providing music to a large scattered audience at low cost. It will play either 10 or 12-in. records, intermixed in any order, and will play both sides sequentially or on one side. It can provide 14 hr of continuous unattended music without repetition or can be set to provide automatically timed periods of music at given intervals. The records are positioned vertically in the machine and removed and returned to the library automatically. The industrial Select-O-Matic Library is shown in the illustration to the left.

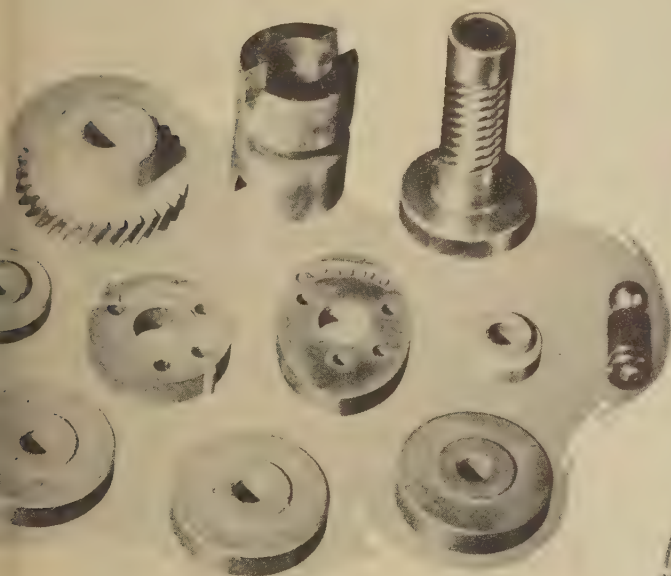


Non-Stop Record Player

The incorporation of strength, light weight, and trouble-free and vibration-less operation into the new Seeburg Select-O-Matic "200" Library involved a careful selection of materials as well as ingenuity in design. The manufacture of this unit, as well as the material selection and construction, are described in this article.

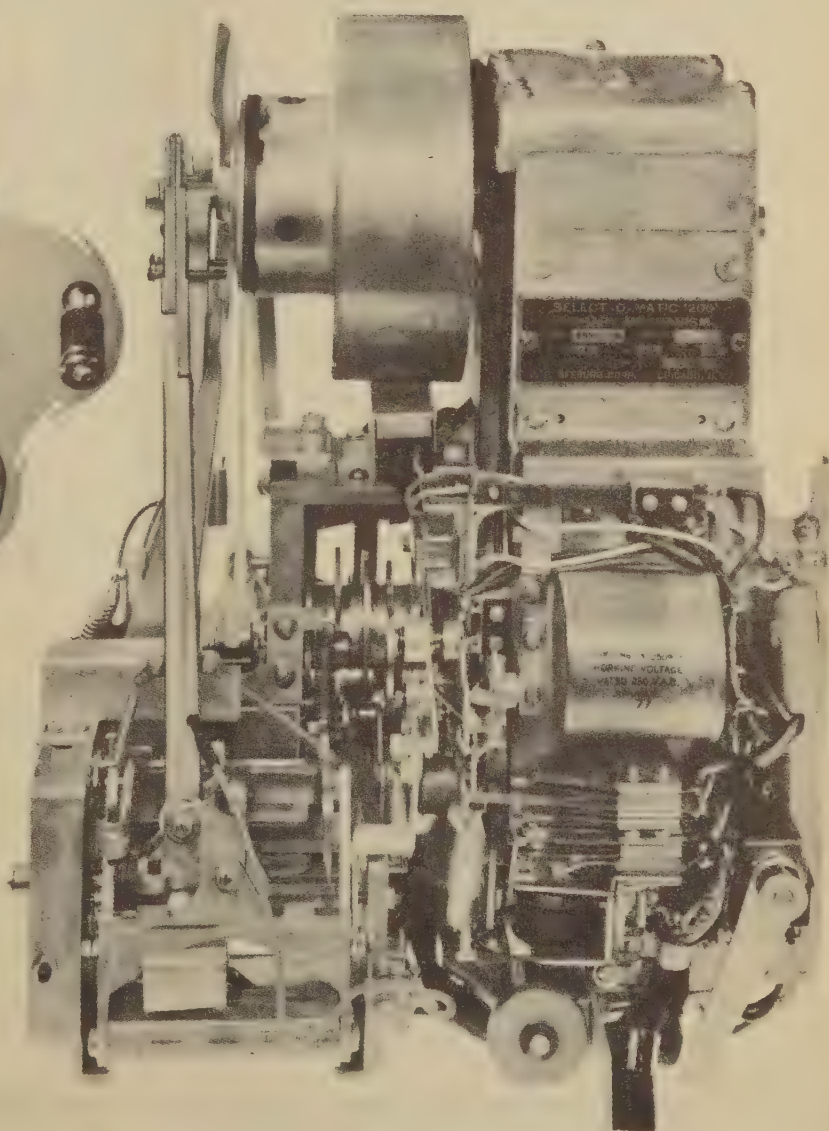
ween pressed metal parts. This is illustrated in fig. 5. The Bakelite gear, of patented design, is used to suppress any vibrations that might be set up in the gear train. This gear has an uneven number of teeth in order that the same teeth of the Bakelite gear do not mesh regularly with the same teeth in the mating gear. This is the method of reducing wear.

The motivating mechanism of the unit is the carriage, fig. 1, that moves back and forth along a gear rack running the entire length of the record library. The entire record selection depends upon the precise positioning of this carriage behind the library of records. The four primary assemblies of the carriage are the electrical assembly, the gear box, the tone arm, and



ABOVE

FIG. 2 - These powdered iron parts are used in the record player. They include the clutch for the turntable, a drive mechanism gear, cams, guide wheels and several other parts. The functions of some of these parts are shown in fig. 5.



RIGHT

FIG. 1 - The main carriage of the record player operates along a track in the base of the unit and selects, positions, rotates, positions the tone arm, and replaces the record in the library.

TABLE I

Machining Sequence of Finishing the Main Carriage Frame of the Seeburg Select-O-Matic Library

Operation	Tool Description	Remarks
1—Inspection.		
2—Mill three rest surfaces, 6.140 in. ± 0.002 in. from top.	Index milling fixture. Mask plate, special for Hartford Super Spacer. Face Plate. Height gage. Go gage 1.254 in. diam.	Cincinnati vertical milling machine, 2-in. diam flycutter, and Hartford Super Spacer used.
3—Inspection.		
4—Ream one 0.375 in. diam hole, $+0.001$, -0.000 in., $\frac{1}{4}$ -in. deep. Ream one 0.375 in. diam hole, $+0.001$, -0.000 in. through. Drill four 0.1875 in. diam hole, $+0.002$, -0.000 through. Drill one 0.191 in. diam hole, $+0.002$, -0.000 in. through. Drill two 0.265 in. diam holes through. Drill one $\frac{5}{32}$ in. diam hole through. Coredrill one $\frac{23}{64}$ in. diam hole through.	Drill and reaming jig.	Use standard high speed steel 23/64 in. coredrill.
5—Deburr 11 holes drilled and ream reamed in previous operation.		Standard high speed steel 120° countersink.
6—Inspection.		
7—Mill 6.115 in. diam, ± 0.002 in. to the rest surfaces.	Milling fixture. Height gage for 6.115 in. diam.	Cincinnati vertical milling machine, 6-in. diam shell end mill.
8—Mill four lugs to 1.836 in. diam, ± 0.002 in. Index. Mill face to 1.031 in. diam, ± 0.003 in.	Index milling fixture. Face Plate. Gage to check diameters. Depth dial indicator.	Cincinnati horizontal milling machine, 4-in. diam shell end mill. Hartford Super Space with four positions.
9—Mill four bearing faces for mounting vertical clutch housing to 0.891 in. diam ± 0.001 in.	Milling fixture. Gage to check diameters. Depth dial indicator.	Cincinnati vertical milling machine, $2\frac{3}{4}$ in. diam shell end mill.
10—Mill two motor mounting pads to 3.680 in. diam, ± 0.003 in.	Milling fixture, gage to check location of pads. Depth dial indicator.	Cincinnati vertical milling machine, $\frac{7}{8}$ in. diam end mill, $5\frac{1}{4}$ in. long.
11—Mill edge to 0.602 in. diam ± 0.005 in. x $2\frac{3}{4}$ in. wide.	Milling fixture, gage to check location of pads and cutout, depth dial indicator.	Cincinnati vertical milling machine, $2\frac{3}{4}$ in. diam shell end mill.
12—Inspection.		
13—Bore two 0.5625 in. diam holes, $+0.001$, -0.000 in. in line; and face $\frac{7}{8}$ in. diam boss to 3.805 in. diam. ± 0.003 in. Chamfer $1/64 \times 45^\circ$ on outside, both sides.	Setup bar, boring fixtures, standard bolster plate, long boring bar, short boring bar, special D.E. plug gage, bore locating gage, indicating head, indicating gage to check 3.805 in. diam, indicating plunger.	Excello 1212A boring machine. Check location surfaces for chips and burrs.
14—Bore two 0.439 in. diam holes, $+0.001$, -0.000 in., in line. Chamfer $1/64$ in. x 45° on outside both sides.	Boring fixture, setup bar, standard bolster plate, two boring bars, special D.E. plug gage, setup fixture for 0.439 in. bore.	Excello 1212A boring machine. Use standard GO plug gage.
15—Inspection.		
16—Deburr milled surfaces.		
17—Inspection.		
18—Drill one 0.250 in. diam hole $+0.002$, -0.000 in. through. Drill two 0.238 in. diam holes through, in line. Drill four 0.136 in. diam holes through. Countersink two 0.136 in. diam holes to $13/64$ in. diam x 120° , using $\frac{1}{4}$ in. diam drill.	Drill and reaming jig, D.E. plug gage, special D.E. alignment plug gage.	Use extra long drill,
19—Ream two 0.2505 in. diam holes, $+0.001$, -0.000 in., in line.	Drill and ream jig, special D.E. plug gage, setup fixture.	
20—Drill one 0.1065 in. diam hole through. Deburr one 0.1065 in. diam hole.	Drill plate, drill and ream jig.	
21—Drill two 0.136 in. diam holes, $5/16$ in. deep. Deburr two 0.136 in. diam holes. Tap two No. 8-32 holes, $\frac{1}{4}$ in. deep,	Drill plate, holding fixture.	

Operation	Tool Description	Remarks
22—Drill two 0.238 in. diam holes through, in line. Drill two 0.1875 in. diam holes $+0.002$, -0.000 in.	Drill and ream jig, D.E. plug gage, setup fixture.	Use extra long drill.
23—Drill two 0.147 in. diam holes. Drill one 0.238 in. diam hole. Drill one 0.159 in. diam hole.	Indicating gage for squareness of 0.238 hole, setting master, special D.E. alignment plug gage.	
24—Ream two 0.2505 in. holes, $+0.001$ -0.000 in., through in line. Redrill four 0.201 in. diam holes $9/16$ in. deep and countersink to $9/32$ in. diam x 120° . Tap four $1/4$ -20 holes, $7/16$ in. deep. Drill one 0.255 in. diam cored hole to $13/32$ in. diam, through.	Drill and ream jig, step core-drill, special D.E. plug gage, D.E. thread plug gage, indicating gear centers gage, location plug, setup fixture, indicating gage for squareness of two 0.2505 in. in. holes, setting master, gaging plug.	Use standard high speed steel, $13/32$ in. diam core drill.
25—Stepdrill two 0.177 in. diam holes through. Ream two 0.187 in. diam holes through, $+0.000$, -0.001 in. Drill two 0.1015 in. diam holes through. Drill two 0.161 in. diam holes. Drill one $3/8$ in. diam hole. Drill four 0.201 in. diam holes. Drill one 0.093 in. diam hole.	Drill and ream jig, stepdrill, D.E. plug gage, setup fixture.	
26—Drill two 0.136 in. diam holes. Drill one $9/32$ in. diam hole. Redrill three 0.136 in. diam holes, one $3/8$ in. deep and two through. Countersink $13/64$ in. diam x 120° , first level. Redrill two 0.136 in. diam holes $3/8$ in. deep and countersink to $13/64$ in. diam x 120° , second level. Redrill two 0.136 in. diam holes and countersink to $13/64$ in. diam x 120° , third level. Tap three No. 8-32 holes, one $1/4$ in. deep and two through, first level. Tap two No. 8-32 holes, $1/4$ in. deep, second level. Tap two No. 8-32 holes, $5/16$ in. deep, third level.	Holding fixture, drill plate, step-drill, D.E. thread plug gage, special D.E. plug gage.	Use standard high speed steel 120° countersinker.
27—Drill two 0.136 in. diam holes $7/16$ in. deep. Redrill four 0.136 in. diam holes through. Redrill four 0.161 in. diam holes through and countersink 120° x $7/32$ in. diam. Drill one 0.187 in. diam hole, $+0.002$, -0.000 in. Tap four No. 10-32 holes. Turn jig. Redrill four 0.161 in. diam holes, $1/2$ in. deep and countersink 120° x $7/32$ in. diam. Tap four No. 10-32 holes, $3/8$ in. deep. Drill one 0.246 in. diam hole, $5/8$ in. deep. Ream one 0.250 in. diam hole, $+0.002$, -0.000 in., $5/8$ in. deep. Ream one 0.250 in. diam hole, $+0.002$, -0.000 in. Redrill four 0.201 in. diam holes and countersink to 120° x $9/32$ in. diam. Tap four $1/4$ -20 holes through.	Drill jig, stepdrill 0.161 in. diam, stepdrill 0.201 in. diam, D.E. plug and thread plug gages, setup fixture.	Use long series No. 29 drill, Use No. 10-32 extension tap.
28—Drill three 0.180 in. diam holes through. Ream two 0.187 in. diam holes through, $+0.000$, -0.001 in. Drill one 0.136 in. diam hole. Spotface $15/32$ in. diam five places to 3.555 in., ± 0.003 in diam. Spotface $7/16$ in. diam boss to 0.212 in., diam, ± 0.003 in. Countersink five 0.136 in. diam holes for tapping. Tap five No. 8-32 holes. Deburr one 0.159 in. diam hole. Tap one No. 10-32 hole through.	Drill and ream jig, extension for counterbore, D.E. plug and thread plug gages, gage to check spot-facing, gaging button and D.E. thread plug gage.	Use $1/4$ -20 extension tap. 15/32 in. diam counterbore with 0.134 in. pilot. $1/2$ in. diam counterbore with 0.157 in. pilot (standard high speed steel, 120° countersink), No. 29, 0.136 in. diam long series drill, No. 8-32 extension tap, No. 10-32 extension tap.
29—Inspection.		

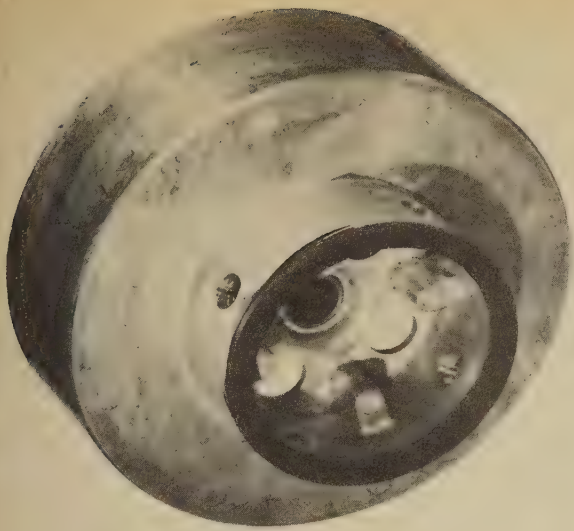
Operation	Tool Description	Remarks
30—Deburr one 0.250 in. diam hole and one 0.2505 in. diam hole. Countersink two 0.136 in. diam holes to 120° x 13/64 in. diam. Tap one No. 6-32 hole through. Tap two No. 8-32 holes through, first level. Tap two No. 8-32 holes through, second level.	Holding fixture, D.E. plug gage, D.E. thread plug gage.	Use standard 120° countersinking tools.
31—Countersink two 0.136 in. diam holes to 120° x 7/16 in. deep to 13/64 in. diam. Tap two No. 8-32 holes, 5/16 in. deep. Redrill four 0.136 in. diam holes through and countersink 120° x 13/64 in. diam. Tap four No. 8-32 holes through. Deburr one 0.187 in. diam hole, +0.002, —0.000 in. Redrill three 0.136 in. diam holes through and countersink 13/64 in. diam x 120°. Tap three No. 8-32 holes through.	Holding fixture, Stepdrill, D.E. thread plug.	Extension countersink tool and extension tap.
32—Countersink two 0.161 diam holes to 7/32 in. diam x 120°. Tap two No. 10-32 holes 5/8 in. deep. Countersink two 0.1015 in. diam holes to 5/32 in. diam x 120°. Tap two No. 5-40 holes through. Deburr two 0.187 in. holes, +0.000, —0.001 in. Redrill two 0.136 in. diam holes through and countersink to 13/64 in. diam x 120°. Tap two No. 8-32 holes through. Redrill two 0.201 in. diam holes and countersink to 9/32 in. diam x 120°. Tap six 1/4-20 holes through.	Holding fixture, stepdrill, step core-drill, three D.E. thread plug gages, and a D.E. plug gage.	Extension countersink and extension tap for first two holes listed. Standard 120° countersink tools.
33—Deburr one 0.2505 in. diam hole, +0.001, —0.000 in. Deburr one 0.250 in. diam hole, +0.001, —0.000 in., x 5/8 in. deep. Deburr one 0.250 in. diam hole, +0.002, —0.000 in. Deburr one 9/32 in. diam hole. Deburr one 0.2505 in. diam hole, +0.001, —0.000 in. Deburr two 0.1875 in. diam holes, +0.002, —0.000 in. Deburr two 0.147 in. diam holes. Deburr two 0.187 in. diam holes, both sides, +0.000, —0.001 in. Deburr one 0.180 in. diam hole, both sides. Deburr one 3/8 in. diam holes, both sides. Deburr one 0.238 in. diam hole, one side. Deburr one 13/32 in. diam hole, one side.		
34—Inspection.		
35—Deburr by hand reaming one 0.2505 in. diam hole, +0.001, +0.000 in. to remove burrs from tapping.	Special D.E. plug gage.	
36—Deburr two 0.438 in. diam holes, +0.001, —0.000 in., in line on inside, two places.	Special D.E. plug gage.	No burr deburring tool required, 7/16 in. diam.
37—Deburr two 0.5625 in. diam holes, +0.001, —0.000 in., on inside, two places.	Special D.E. plug gage.	No burr deburring tool required, 0.562 in. diam.
38—Deburr two 0.2505 in. diam holes, +0.001, —0.000 in., in line on inside, three places.	Special D.E. plug gage.	No burr deburring tool required, 1/4 in. diam.
39—Deburr two 0.2505 in. diam holes +0.001, —0.000 in., in line on inside, two places.		
40—Deburr inside of one 0.191 in. diam hole, +0.002, —0.000 in.; one 0.187 in. diam hole, +0.002, —0.000 in.; and one 13/32 in. diam hole. Deburr inside of one 0.265 in. diam hole. Deburr one 5/32 in. diam hole.		Use 3/16, 13/32, and 0.265 in. diam tools.
41—Remove all burrs not previously removed.		Use scraper for 5/32 in. hole.
42—Inspection, wash, and reinspect.		File or scraper.

the rack or track along which the carriage travels.

As the bulk of this assembly is diecast, there are a variety of machining operations that must be done. Because parts must be totally interchangeable, the necessity for machining the die castings to extremely close tolerances is vital. For example, in the gear box assembly, the gear

box itself, an aluminum die casting, must be machined so that horizontal and vertical alignment of the holes in the box are accurate to 0.001 in. In the machining, there is a multiplicity of facing, drilling and reaming operations.

All machining operations are detailed on a "Manufacturing Procedure Chart." In addition to identifying the part, the material of which it

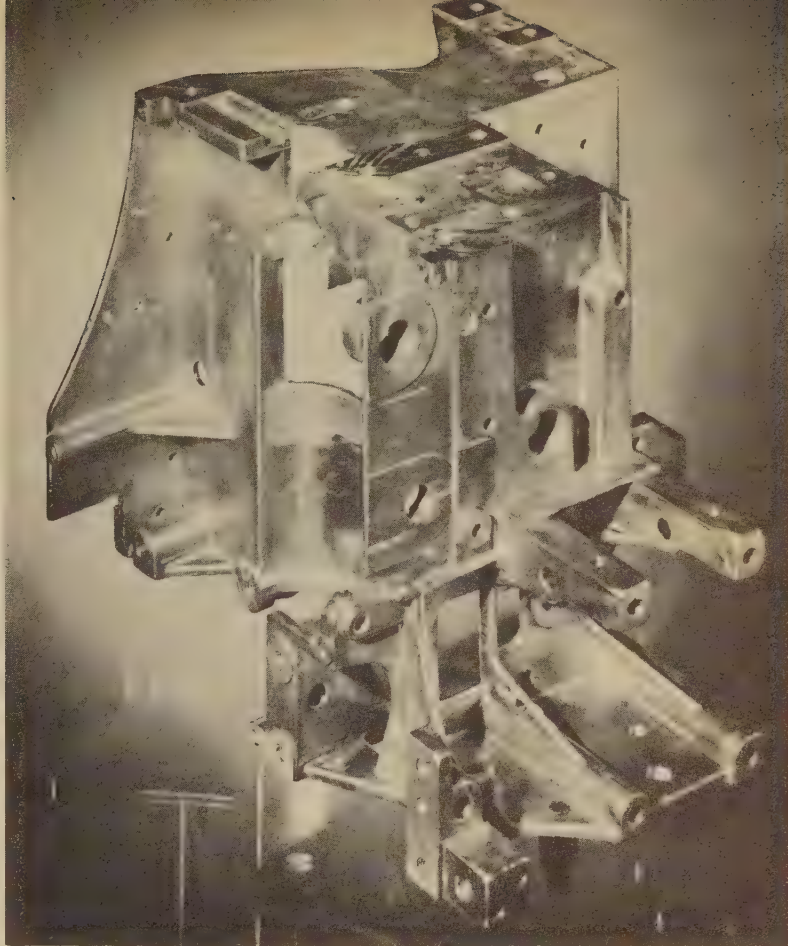


ABOVE

FIG. 4 - The turntable or record rotator is a zinc diecasting that weighs 4½ lb. The black rubber ring cemented to the face of the part prevents slippage of the record during playing.

RIGHT

FIG. 3 - The main carriage frame, upon which practically the entire carriage mechanism is mounted, is an aluminum die casting.



is made, and general information, it contains the machining sequence, the tool numbers, the tool description, remarks pertaining to each operation, and the department or the operation. A sample of this process chart is shown in fig. 6.

On the main diecasting that makes up the carriage frame and to which is anchored all of the remaining parts making up the carriage, there are 16 milling, 87 drilling, 11 reaming, 57 tapping, 50 deburring, 20 countersinking, four boring, four chamfering, seven spotfacing, four stepdrilling and one coredrilling operations. After being received from stock and inspected, the part is first milled on three rest or positioning surfaces in a Cincinnati vertical milling machine using a 2-in. flycutter. All subsequent machining operations are located from these surfaces. The machining sequence of finishing this main carriage frame is shown in table I.

Likewise, the machining of the gear box diecasting is set up in a prescribed sequence of operations, as are the finishing of other machined parts. In many cases, the same machines are used to machine several parts, but through the use of special jigs and fixtures, the parts can be run through in batches, depending upon which parts are needed by assembly, with little loss of time in machine setup. As stocks of finish-machined parts are built up, they are transferred as needed to the assembly floor.

Here, parts finished by Seeburg, those purchased from subcontractors, and subassemblies are brought together for assembly into the mechanism. The audio assembly is another function and is not included in the record storing and playing assembly.

Assembly progress is in the form of several feeder lines into a main assembly line. At the first station, the base, shock mounts, mounting strips, carriage track and the first main bracket subassemblies are mounted onto the base. At

station two, the trip mechanism and the safety trip mechanism, the record clamp arm and disk assembly, the cam follower arm and the cam assembly, the stripper plate and the record chute are mounted on the main carriage frame.

At the third station, the transfer arm, the record contact arm, the pilot light socket and the housing are mounted on the base. The fourth operation is to assemble the switch plate and the wiring, which is procured as subassemblies.

At the fifth station, the vertical clutch housing, the gear box, the flywheel or turntable, and the motor and motor coupling are assembled. The motor is also assembled to the gearing. These subassemblies are mounted onto the main carriage at the sixth station. At the seventh station, the pickup arm and the record cradle are assembled, and these are mounted onto the frame at the eighth station.

The switch plate cable and the wiring that was assembled at the fifth station are mounted onto the base at the ninth station and the unit is inspected. The tenth and eleventh stations are for adjustment of the unit, and at the twelfth station the selector panel is mounted to the base. The thirteenth and fourteenth stations are adjustment stations. The record magazine is mounted to the unit at the fifteenth station. At the sixteenth and seventeenth stations, the assembly is adjusted, tested and lubricated.

At the eighteenth station, the assembly is given an electrical breakdown test. Normally, the unit operates on 110 v current and is rated at 117 v. However, the electrical test involves feeding 1300 v through the equipment. This station is completely housed in a transparent plastic case to insure against accidents.

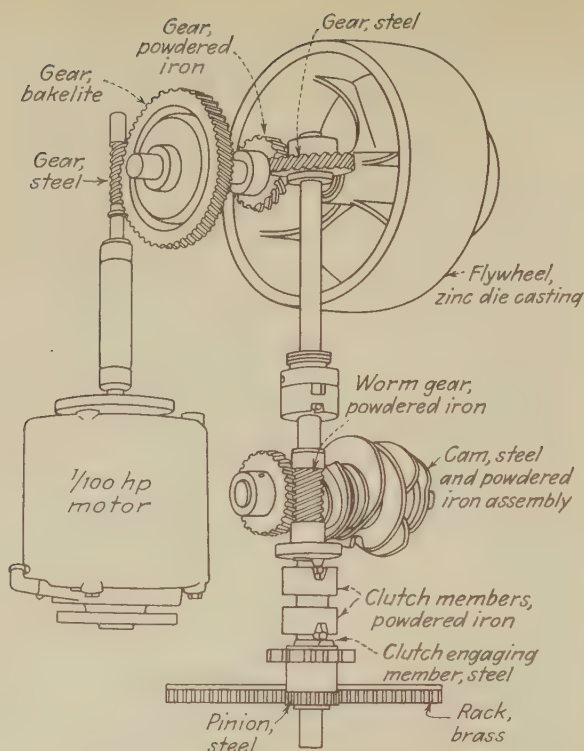


FIG. 5 - The entire unit is driven by a special 1/100 hp motor through a double gearing and clutching arrangement. The gears leading into the turntable or flywheel rotate the record and those leading into the base drive the carriage along the track.

The final station is a complete electrical and mechanical inspection of the unit. Dummy records are run in the unit, and the whole assembly must be in perfect condition.

Following assembly, the libraries are transferred to a run-in-room. Here they are operated continuously for 24 hr, and all adjustments are checked, mechanical and electrical parts are inspected, tested and adjusted, and the unit is made ready for shipment.

The Seeburg Select-O-Matic is an excellent example of engineered production. The feature of the unit itself, such as the 100 record magazine that keeps the records in playing position, vertical playing of the records, selection of any single or any group of records for playing, intermixing of 10 and 12-in. records, and others, are quite novel and definitely functional and desirable. Further, the fact that the unit can be integrally interconnected with a public address system, A.M. or F.M. radio circuits, multiple speakers, amplifiers, microphones, and remote control devices increases its commercial and industrial usefulness. The equipment doesn't obsolete existing amplification, radio broadcasting, or paging systems, but can be installed with these existing sound facilities, and made part of such equipment.

MANUFACTURING PROCEDURE CHART - J.P. SEEBURG CORP.									
RAW STOCK <u>Alum. Alloy Die Casting</u>				ISSUE- <u>11</u> DATE- <u>5-25-48</u>		PART NO. <u>A 250304</u> T55. 11			
BLANK SIZE-WIDTH _____ STRIPS/SHEET _____ PCS/STRIP _____ LINEAR FT./M. _____				MULT. OR SQ. IN. _____ PCS/SHEET _____ SQ. FT./M. _____ RAW WGT./M. _____		PART NAME <u>Carriage Frame</u> <u>Turntable Shaft Sect.</u> <u>Selectomatic</u>			
OPERATION				APPROV. <u>Sample</u> SOURCE <u>PM</u>		FIRST USED ON <u>20053-15</u> SHEET <u>1</u> OF <u>6</u> SHEETS			
OPER. NO.	DEPT.	DESCRIPTION	TOOL NO.	TOOL DESCRIPTION	REMARKS				
5	Purch	Purchase die casting			Spec. Container req'd				
10	Fit 1	Incoming inspection			Run in Cincinnati Vert. mill 6" dia. Shell mill setup on surface plate				
25	Mill	Shell mill top surface	600145 600008 680061 680039	Operation layout Milling fixture Flush pin gage for 2.000 dim. Height block	Run in Cincinnati vert. mill spot check 3.875 & 3.156 dims. Use gage 680062 6" dia. shell mill.				
30	Mill	Shell mill bottom surface to 5.000 ± .005 dim.	600146 600011 680040 680042	Operation layout Milling fixture .297 Depth gage Height block	Run in Kent Owens Mill. Use 1" dia. x 1/2 side mill.				
31	Mill	Mill edge to 61/64 dia.	600011	Milling fixture					
35	Crib M	Inspect							
37	Fin	Deburr milling burrs							
39	Crib	Inspect							
NOTE: THIS CHART MUST NOT BE DEVIATED FROM WITHOUT APPROVAL FROM THE PRODUCTION ENGINEERING DEPT. NOTIFY THIS DEPT. IMMEDIATELY IF CHART CANNOT BE FOLLOWED. PART PRINT MUST BE USED IN CONJUNCTION WITH THIS CHART.									
RAW STOCK		BLANK SIZE-WIDTH		STRIPS/SHEET		PCS/STRIP		LINEAR FT./M.	
OPER. NO.	DEPT.	DESCRIPTION		TOOL NO.		TOOL DESCRIPTION		REMARKS	
40	Drill	40°							
45	Drill	45°							
50	Drill	L							
Core thru.		Core Drill (1) .375 ± .0005 dia.		680052		Spec. D. h. plug gage .3745 - .3755		Check 1.991 & 1.612	
Core Drill (1) 15/32 dia. hole		680054		Spec. D. h. plug gage .1935 - .1955					
Tumble jig.		680065		Bore loc. gage		Instruction sheet			
				Loc. gage (4) .136 holes					
				Loc. gage holes in base					

FIG. 6 - The "Manufacturing Procedure Chart" prescribes the sequence of machining operations and the equipment upon which they are done.

Welding Screw Shafts to Castings



FIG. 1 - After the pattern is removed from the green sand mold, it is placed around the parts to be welded. The hole in the bottom of the half mold at right is where the metal feeds into the thermit cavity. Immediately above the weld location is a riser.

Because cast steel adjusting screws for Hamilton presses were cracking around the shaft, a combination hot rolled or forged steel shaft and cast steel head in the form of a thermit welded assembly was adopted. The method of making this weld is described in this article.

By P. H. SETZLER

United Welding Co., Middletown, Ohio
Welding Engineer,

AN unusual welding job is being done at the United Welding Co., Middletown, Ohio, consisting of joining 7 to 13 in. diam SAE 1040 hot rolled steel shafts to high strength steel castings. The assembly is the adjusting screws used on Hamilton presses and the joining is accomplished by thermit welding. Fundamentally, thermit welding is a casting process, with a reaction starting at about 1200°F and producing molten steel and slag in the proportions of about one-half steel and one-half aluminum slag. At the completion of the reaction the molten steel reaches a temperature of about 5000°F, considerably higher than the steel melting point.

It is this extra heat or super-heat that makes thermit welding possible, in that it melts part of the parent metal and causes fusion between the parent metal and the thermit metal. By adding such elements as ferromolybdenum, ferromanganese, etc., to the thermit mixture, the weld metal analysis can be accurately controlled.

The press adjusting screw assembly, which can be seen in the accompanying illustrations, is preheated preparatory to welding. A green sand mold is made from a pattern in the shape of the parts to be welded, but with a collar or cavity around the weld section to provide space in the sand mold for the thermit metal. This arrangement is shown in fig. 1. The flask is a metal box, shown in fig. 2, designed to take the shaft and the cast steel head in their proper positions. After the mold is made, the metal box or flask is taken apart, the pattern is removed, the pieces to be welded are properly lined up, and the flask

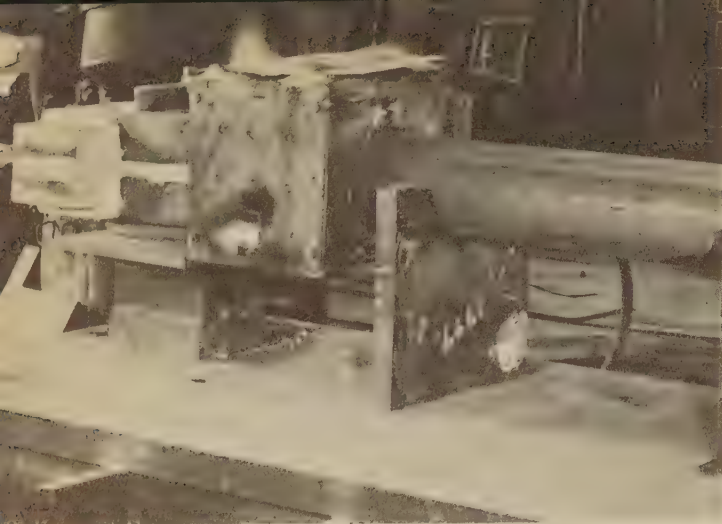
with the sand in place is fitted around the parts. A space is left between the parts to be welded, as shown in fig. 1, so that the thermit metal can surround the ends of both parts of the assembly and heat those surfaces to a fusing point.

At the time the mold is made, provisions are made for a lower heating gate, a pouring gate and a top riser. Bottom pouring is employed. This gating arrangement can be seen in fig. 1. With the mold in place, the parts are heated through the lower gate by a kerosene torch. It is necessary that the temperature of the parts be brought to about 1600°F, otherwise the thermit metal would not generate enough heat to make the weld. When the mold is up to temperature, the torch is removed and the heating gate is plugged with sand.

The crucible with the thermit mix is hung over the mold and the thermit reaction is started. Upon completion of the reaction in the crucible, the bottom plug in the crucible is knocked out. This bottom pouring allows molten metal to enter and fill the mold, and the slag runs out last, filling the top slag pocket. The pouring is in process in fig. 3.

Several hours are required for the mold to cool to a point where the steel box can be removed and the sand cleaned away. The risers are cut off with a gas torch, and the welded parts are normalized. Fig. 4 shows a completed assembly after removal of the gates and risers.

The adjusting screws for the Hamilton presses must take the entire load of the press, in that the presses have neither tie rods nor crowns.



ABOVE

FIG. 2 - The metal box enclosing the mold and the positioning arrangement of the two parts of the adjusting screw are shown here. This photo was taken during pre-heating.

RIGHT

FIG. 3 - The thermit reaction in the crucible takes about 4 min and the pouring less than 1 min. The pouring action is just starting in this photograph.



The slides are pulled down onto the press bed by means of eccentric links which pin into the heads of the adjusting screws. These in turn are fastened into the bed. The screws also allow adjustment of the shut height of the press.

As first designed, the entire assembly of head and screw was a high strength casting. Difficulty was experienced in getting sound castings, and cracks and holes were especially prevalent around the shaft, just under the head. To eliminate this, considerable stock was added to the shaft. The stock necessitated the removal of about $\frac{3}{4}$ in. on each side. This increased the cost of the casting as well as added considerable to the machining costs.

By casting the head and thermit welding it to a hot rolled shaft or forging, the savings in both material and machining costs are considerable.

Only $\frac{1}{4}$ -in. finish machining instead of $1\frac{1}{2}$ in. is required with the welded assembly. Thermit welding is not cheap, because the mix itself is expensive. However, on this particular job it is estimated that, on the average, savings on each screw amount to about \$125. Since each press requires from two to four screws, the savings are substantial.

The range of sizes of shafts welded is from 7 to 13 in. diam. The space provided between the end of the shaft and the end of the casting is from $\frac{7}{8}$ to $1\frac{1}{4}$ in. The end surfaces are gas cut to give a scale or oxide that protects the surface of the shaft during preheating. Preheating requires 4 to 6 hr; the thermit reaction about 45 sec, and the pouring less than 1 min. To give the weld a grain correction, the assembly is normalized at 1650°F before final machining, and then air cooled.

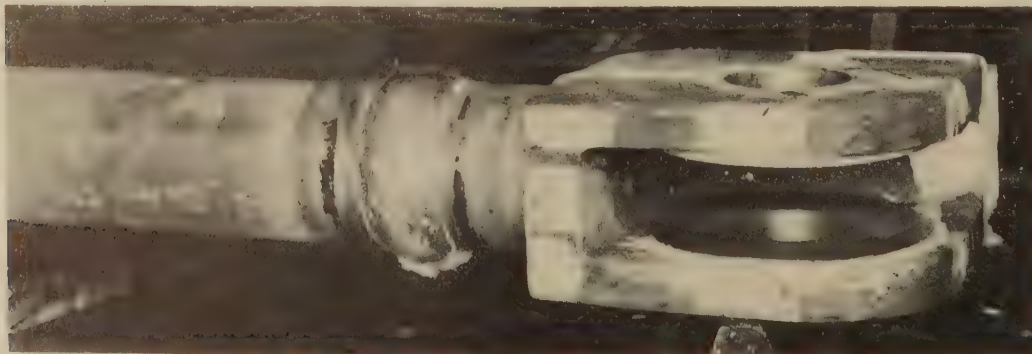


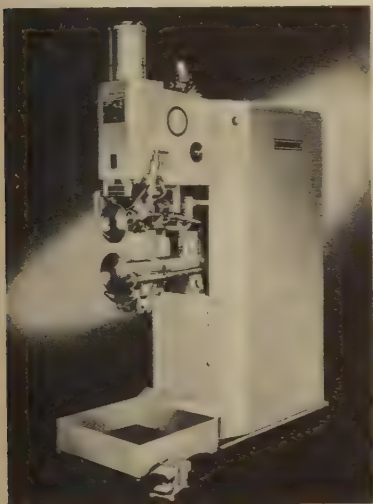
FIG. 4 - View of a completed weld after removal of the gate and riser.

New Production Ideas . . .

Seam welders and a bench type spotwelder, universal and plain milling machines, a punch press, grinders, dip cleaning machines, and an inspection table are featured this week. Small tools and instruments include keyway broaches, die chasers, collet chucks, electrodes, welding tip cleaners, a thread comparator, Brinell hardness indicator, and a flexible template.

Roller Head Seam Welders

A LINE of roller-head seam welders that comprises light, medium and heavy duty models for circular welding, longitudinal welding and a combination of both, fea-



ture a head guided and aligned by four sets of antifriction rollers to insure that welding wheels will follow small deviations in material thickness and contour. These machines maintain constant weld pressures even where stock thickness varies along the seam, assuring even weld characteristics. In design, the front of these machines, developed by *Progressive Welder Co.*, 3050 E. Outer Drive, Detroit 12, are rigid and well braced while in the rear where stresses are not severe, construction is light. Quick changing from circular to longitudinal welding and back is another feature. Large throat clearance is provided to accommodate bulky work and transformer is close coupled to the welding arms to reduce current loss. Welders may be used for continuous, water or gas-tight seam welding, or for roll-spot welding. They may be used for cold

rolled, stainless or other alloy steels, aluminum and other nonferrous alloys as well as various coated materials.

Bench Type Spotwelder

FOR joining small metal parts, *Weldex Inc.*, 7344 McDonald Ave., Detroit 10, has introduced a new, fully automatic $7\frac{1}{2}$ kva bench type spotwelder. The welder handles light nonferrous metals of the same or dissimilar alloy and thickness, on a high speed production basis and will also give efficient, low-cost operation on ferrous metals up to two thicknesses of 14

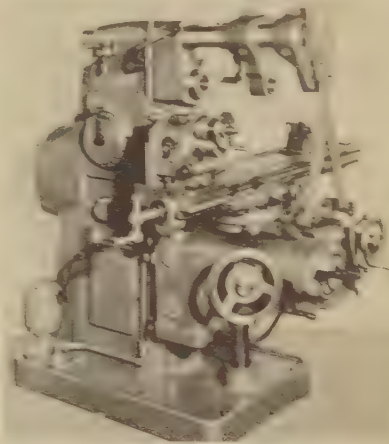


gage cold-rolled sheet or equivalent. High electrical efficiency is assured through superior transformer design coupled with a shorter secondary welding circuit, it is stated. In addition to air strainer, regulator, gage and lubricator, standard equipment includes a built-in four-step transformer tap changing switch, single acting air cylinder, magnetic contactor, and electronic timer. The welder is furnished for 220 v, 60 cycle, single phase ac operation. Standard throat depth is $4\frac{1}{2}$ in.

Milling Machines

NEW 5 hp universal and plain milling machines incorporating the extended spindle face, announced by *Browne & Sharpe Mfg.*

Co., Providence 1, have an increased vertical capacity, a No. 50 milling machine standard taper hole in spindle, suitable spindle speeds for larger cutters, and ample rigidity for using the greater power. Full

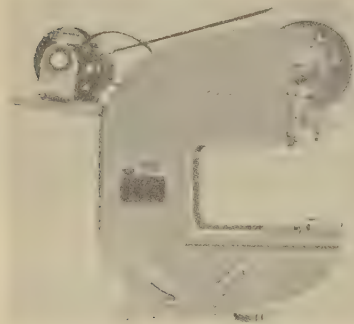


5 hp, all-gear drive is provided to cutters. Cutting feed and fast travel are independently all-gear driven by a $\frac{3}{4}$ hp motor synchronized with spindle motor. Fast travel of 75 ipm in all directions, is available with spindle rotating or stopped. A single lever selects any of the 18 spindle speeds from 30 to 1200 rpm. The universal and plain machines have a longitudinal feed of 28 in., transverse feed of 10 in., and vertical feed of $16\frac{1}{2}$ in.

Punch Press

THROAT depth on a 4-ton punch press, announced by *Benchmaster Mfg. Co.*, 2952 W. Pico Blvd., Los Angeles 6, has been increased to punch to the center of a $17\frac{1}{2}$ -in. circle, making the press suited to sheet metal work and jobs requiring deep horizontal space. Adequate power is furnished on most jobs with a $1\frac{1}{3}$ hp motor. The press may be used either with or

without the 6x8x1-in. bolster plate. The standard deep throat punch press is supplied with 1 or 1¼-in. stroke. The ram position is adjustable. A positive, single trip, safety mechanism is employed to engage



the flywheel. The new press may be supplied as a bench or pedestal model with inclinable frame positioning.

Power Press Pitman

TO prevent power press overloading, a hydro-pneumatic pitman is now available which is designed so that when overloading occurs during the work cycle, the pitman, which carries the ram of the press, retreats the required amount against a high pressure hydraulic cylinder. This allows the overload linkage to shorten and permits the press to continue through its work cycle with the desired pressure and working protection afforded the machine, tools and work. Resetting and re-establishing of the fluid in the cylinder is accomplished by a pneumatic pumping mechanism operated off the shop air line, assuring constant hydraulic pressure on the piston and constant working pressure at all times. The press ram adjustment is made in the usual manner. The hydraulic pitman is manufactured by *Dayton Rogers Mfg. Co.*, 2824 13th Ave., S., Minneapolis 7, in sizes from 55 tons up to fit all presses.

Safety Abrasive Wheel

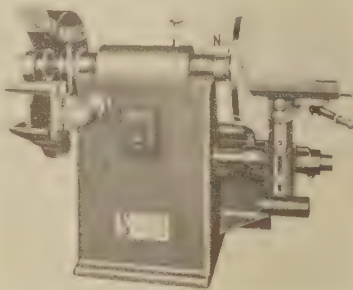
A SAFETY abrasive wheel, developed by *J. C. Mfg. Co.*, 259 7th Ave., New York, features a simple rotary locking mechanism for replacing the abrasive cloth and is guaranteed not to open while in motion. Wheels are 5 or 6 in. diam, have an all metal frame, 7/8 in. bore, 1½ in. wide abrasive, with 100 pct wool felt cushion.

Keyway Broaches

A SET of standard Keyway Broaches has been developed by *Zagar Tool, Inc.*, 23880 Lakeland Blvd., Cleveland 17, for use on short stroke broaching machines in plants where there are many different sizes of keyways to be produced in production quantities. The standardized broaches make keyways ½ in. wide x ¼ in. deep x 4 in. long on 20-in. stroke broaching machines and keyways up to 1 in. wide x ½ in. deep x 6 in. long on 33 in. stroke broaching machines.

Grinder-Disk Grinders

A FEATURE of the redesigned grinder-disk grinders made by *Standard Electrical Tool Co.*, 2505 River Rd., Cincinnati 4, is thrust-bearing construction that permits bearing wear to be taken up with-



out dismantling the spindle assembly. This machine has a self-contained belted motor drive. The enclosed ball bearing motor is on an adjustable bed plate attached to the back of the pedestal. Power is transmitted through multiple V-belt drive. Left hand side is arranged for a maximum of 24x3x1¾ in. grinding wheel powered by a 10-hp motor. The smallest size is 10 in. with a 1 hp motor. The right hand side is arranged to accommodate plate mounted disk grinding wheel from 24 to 10 in. diam, depending on size of machine. Optional equipment is either the lever feed universal table or a plain swivel table.

Carbide Tipped Die Chasers

CARBIDE tipped die chasers with ground thread forms are now available for selected applications on turret lathes, automatics and threading machines. Made by *Jones & Lamson Machine Co.*, Springfield, Vt., these die chasers are said to increase threading

speeds with greater tool life and economy. They are effective in hard steel and more efficient in hard rubber, fiber and abrasive materials which have a rapid dulling action on ordinary chasers.

Electric Bench Grinder

AN electric bench grinder announced by *Speedway Mfg. Co.*, 1834 S. 52nd Ave., Cicero 50, Ill., uses grinding wheels 6x¾ in. that are operated by a ¼ hp air cooled motor. Tool rests are fully adjustable to compensate for wheel wear and built-in side guides of precise angles simplify proper grinding of tools.

Collet Chuck Lathe

A MODIFICATION of the quick acting Goodwin collet chuck has been made to adapt it for use with a standard electric motor to perform as a low cost lathe for secondary operations such as deburring, filing, and polishing. The adaptation of the chuck, made by *Goodwin Mfg. Co.*, Cuyahoga Falls 25, Ohio, varies from its conventional use on tool room and production lathes, and conversion is accomplished by addition of shaft adapter and adjustable stop. A spring ejector is available. The chuck body is made in two parts for mounting accuracy and is designed to run true on the motor



shaft. Models are available with straight or tapered holes. Positioning is supplied through a control lever and powerful pressure is said to be exerted through a multiple leverage principle that utilizes cantilever action of hardened steel fingers. A 1-in. capacity size

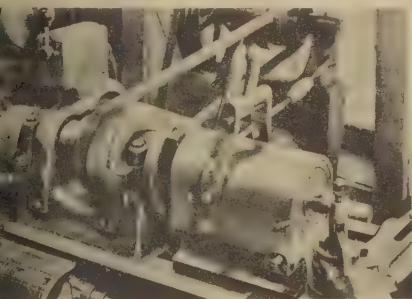
motors having up to 1½-in. shaft diam with the OD chuck diam of 3½ in. The 2-in. capacity model fits any shaft up to 3¾ in. diam with the OD chuck diam of 5½ in.

Brinell Hardness Indicator

A DIRECT reading Brinell hardness number indicator, called Brinell Hardness Reader, developed by Harry W. Dietert Co., 9330 Roselawn Ave., Detroit 4, fits into the hand. The dial of the unit is calibrated in Brinell hardness numbers, with two calibrations available; one for the 10 mm ball diameter with 3000 kg load and the other for the 10 mm ball diameter with 500 kg load. The Brinell hardness impressions are made in the usual manner with a Brinell indenter, after which the Reader is pressed against the piece under test so that the ball point of the Reader enters the impression. The hand of the Reader will point to the correct Brinell hardness number without the use of a conversion table.

Collet Speed Chuck

ROTATING on its own precision ball bearings a new type of collet speed chuck, designed by Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 17, increases the holding capacity, maintains accuracy, and eliminates overhang and chatter. It derives its turning power from the spindle of the machine to which it is attached. The collet remains stationary while opening and closing, making it possible to maintain accurate length dimensions on parts being machined. The working mechanism of the collet closing device is located



between the two precision ball bearings. Chucks are designed in 1 and 2-in. through capacities, made to order to suit any type lathe, grinding machine, or other rotating spindles. The 1-in. size uses a standard 5C collet and the 2-in. size, a Zagar No. 310 draw-type master collet with No. 6 W&S collet pads.

Instrument Air Dryers

THE BY line of Lectrodryers developed for drying instrument air are fully automatic, which makes possible the reactivation, cooling and reversal of the machines' dual adsorber towers without manual attention. They are built for operation with either steam or electric reactivation. Standard sizes range up to 5000 cfm. This line, manufactured by Pittsburgh Lectrodryer Corp., Pittsburgh 30, removes moisture from air and gases by means of the physical phenomenon known as solid adsorption.

Dip Cleaning Machine

A FULLY automatic unit known as the Krazy Dip cleaning machine, which is recommended for washing metal parts in automotive and aircraft shops, service stations,

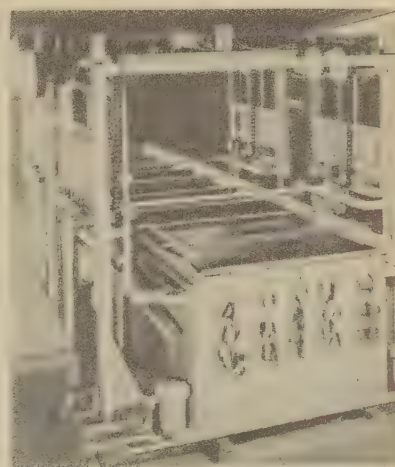


repair shops and metalworking plants, has been marketed by Magnus Chemical Co., Inc., Garwood, N. J. This is a cold cleaning machine that requires no heating. Extra agitation moves parts in the cleaning solution 160 times a minute, the carbonized oil and dirt being forced from crevices and washed to outside. The unit operates from an air compressor and uses no pump, electric motor, speed reducer, gears or belts. Air consumption is 1 to 2 cu ft per min and minimum pressure required is 50 psi. The cleaner is built of 14 gage sheet with hinge cover and fusible safety link.

Cleaning and Pickling Machines

AUTOMATIC handling equipment for cleaning and pickling metals before plating and for successive dipping processes in other industries have been developed by Belke Mfg. Co., 947 N. Cicero Ave.,

Chicago 51. The machine consists of a series of tanks with mechanism for automatically lifting and transferring racked parts on rods from tank to tank progressively at



any desired preset interval from 10 sec to 20 min. A large fixed processing frame with processing saddles for each tank extends the length of the tanks and beyond at the unloading end to form an unloading saddle. A chain type conveying mechanism moves the transfer frame around a rectangular circuit. Once set the transfer machine operates automatically. The automatic timer may be turned off and the machine operated by start and stop push button control. The standard automatic transfer machine accommodates 8 tanks approximately 24 in. wide x 48 in. long x 42 in. deep.

Form Tool Blanks

A COMPLETE line of circular form tool blanks to be used for circular tools on all types of automatic screw machines has been announced by Production Service Co., 1060 Broad St., Newark 2, N. J. These blanks are made from a standard brand 18-4-1 high speed steel, and can be furnished soft or in a hardened condition, having Rc 64-65 hardness.

Hard Surfacing Electrodes

TWO new electrodes of the coated tubular type for depositing abrasion resisting surfaces have been manufactured by Lincoln Electric Co., Cleveland 1. Electrodes are steel tubes in which is contained a hard surfacing alloy in a concentrated form. Alloy is deposited into the molten crater where it is either bonded into an

iron alloy matrix or alloyed by the heat of the arc with the base metal to create the final hard surfacing alloy. Tungweld C is recommended for tools where abrasion is severe. Tungweld F produces a smoother, thinner and sharper edge. Both electrodes are available in 14-in. size, packed in 5 lb containers.

Welding Tip Cleaner

A WELDING tip drill kit approximately the size of an automatic pencil has been designed by *J. M. Ragle Industries*, Kansas City. The end is a tempered steel double-end chuck holding drill sizes 45 to 80. The handle holds 24 different size carbon steel drills. Twelve assorted drills in even number sizes 52 to 74 are supplied with the kit.

Pulley Lagging

ALL-PURPOSE waterproof lagging that is quickly and easily applied without rivets, bolts, or heat, and that dries within 10 hr at room temperature has been produced by *Condersite Engineering Corp.*, 2015 Chancellor St., Philadelphia 3. This tough, wear-resistant lagging is weather and corrosion resistant, unaffected by sulfuric acid, oxidizing agents, soaps, alcohol, etc. The lagging consists of a mineral base fabric and the Condersite waterproof compound. The lagging, which is suitable for crown, split and flat pulleys, for use with leather, cord, wire-woven, or rubber belts, comes in units of 70x40" treated fabric and sufficient compound for application, cut to sizes for any pulley, or in rolls of widths up to 42 in.

Bonding Film

A METAL-TO-METAL bond resistant to shear tests up to 3500 psi is provided by a film of pure adhesive called Scotch-Weld Bonding Film, announced by *Minnesota Mining & Mfg. Co.*, 900 Fauquier Ave., St. Paul. It is transparent, 100 pct adhesive, with no supporting material. The film is placed between units to be bonded and is cured by simultaneous application of heat and pressure—a heat of 300° to 500°F for 5 to 60 min and a pressure of 25 to 100 psi, both varying with type of bond desired. Preparation of surfaces requires only conventional cleaning. The film comes in rolls like tape and is not tacky to the touch.

Inspection Table

AN elevator hopper on an inspection table, announced by *D. H. Prutton Machinery & Tool Co.*, 5295 W. 130th St., Cleveland, feeds



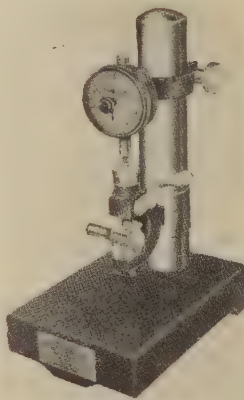
any small, mass-production item on a 2x8-ft conveyer belt for visual inspection. A multi-speed transmission and a variable angle control allow any desired distribution on the table. Small parts, such as nuts, bolts, washers, etc., can be inspected at the rate of 130,000 pieces per hr. The inspection table requires only 48 sq ft of floor space.

Flexible Template

AN adjustable spring template designed for all kinds of layout work is now available. The template, manufactured by *Flexible Template Co.*, Camden, N. J., is set and locked to reproduce desired shape, contour, curve or radius. When unlocked, it springs back into original position.

Thread Comparator

THE Swanson thread comparator, manufactured by *National Automatic Products Co.*, 23 Whiting St., New Britain, Conn., tells



at a glance whether a product is oversize, undersize, eccentric, tapered or if lead error exists. The indicator records work visually to accepted ring gage tolerances. It is said to save production time and

lower overhead costs by cutting precision inspection time, by reducing maintenance cost of gages and by replacing ring gages and setting plugs. The comparator consists of the stand with indicator and standard thread unit. All classes and forms of threads in a size to 1½ in. may be checked on ring gage tolerances. One unit and one setting plug, by allowing difference on indicator, will take care of four thread classes.

Paint Stripper

A NEW cold solvent material designed to permit fast, thorough removal of paint and similar finishes from metal surfaces has been announced by *Oakite Products, Inc.*, 130H Thames St., New York 6. For use at room temperature, this Composition No. 15 may be applied by tank immersion method or by swabbing or brushing. This is followed by hot pressure rinse to remove loosened paint particles.

Industrial Counter

TYPE 82-A single control register, produced by *Ohmer Counter Dayton*, is a double counter featuring an upper set of figures recording a count up to 999, and a lower set of figures giving a grand total accumulative up to 99,999. The register total may be returned to zero any time—at the end of a shift run, or the completion of a count. The register is operated by a lever moved by hand or actuated by a mechanism with a reciprocating motion. The counter can be fitted with a bell to ring at each operation.

Safety Floor Finish

ELIMINATION of falls resulting from hazardous footing is possible with the new safety floor finish, Traffic-Tred, a product of *Watson-Standard Co.*, 225 Galveston Ave., Pittsburgh 30. The material is an abrasive floor coating that is applied like paint. It dries to a hard, rough surface with a texture much like coarse sandpaper and works equally well on steel, wood or concrete, removing most of the danger from walking areas subject to dampness, greasiness, or other slippery conditions. Surfaces treated with Traffic Tred are easily cleaned and easily renewed. If patched, it is stated,

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• GM engineers give results of research on its high compression engines . . . New plant to build GM's hydraulic units . . . Ford adds to its steel facilities.



DETROIT—This week General Motors gave the industry's top engineers another peek under the hood at its high compression engines. The occasion was a meeting of the Society of Automotive Engineers where John M. Campbell, Darl F. Caris and Dr. Lloyd L. Withrow of GM Research Laboratories read a paper on the subject, "Increasing the Thermal Efficiencies of Internal Combustion Engines."

With the entire automobile industry absorbed at the moment in high compression engines, the GM paper naturally drew considerable attention. It is well known that Oldsmobile will soon begin pilot production of a high compression engine that is expected ultimately to operate at a 12.5 compression ratio. Cadillac, it is understood, will introduce a new high compression engine, probably in October or early November. Ford engineers are also working intensively on high compression motors for their three lines of cars.

The fact that Chrysler's phenomenal rise in the industry followed

closely its introduction of a high compression engine has left its engineers fully conscious of the possibilities of high compression ratios. Some sources believe a high compression engine may be one of the surprise packages in Chrysler's new model plans.

The strongest argument for high compression engines is, of course, fuel economy. The paper discloses that comparative studies of standard production engines and a research laboratory six-cylinder high compression engine have shown fuel economy ranging up to 40 pct, plus an efficiency increase over the standard engine.

With the high compression engine, the report said, "still greater gains are to be had in road-load economy at car speeds lower than 40 miles per hr."

"Gains as high as 50 pct have been observed in tests made to compare the high compression engine with the 6.5-1 engine under city traffic conditions, the paper disclosed.

The GM researchers also stated that the new engines are up to accepted standards of smoothness, flexibility and performance.

Ignition is obtained with a 6-v battery system, using a modified conventional coil.

The immediate hope for high compression engines stems from intermediate designs GM has designed and tested since the original experimental engines were built. Several engines have been designed to operate at compression ratios "intermediate between current production levels and that of the 12.5 experimental engine."

Two of these engines operating at 8 to 1 ratios have been tested, the report discloses. These engines can be operated with some of the better premium grades of gasoline sold commercially since the war (i. e., ethyl premium gasolines). With these fuels, the GM researchers claim, gains in economy as high as 25 pct were realized.

Gains in fuel economy of 10 to 25 pct are possible at octane levels "not much above those established

by some premium gasolines," the report said.

PART of GM's enthusiasm for engines stems from the fact that the petroleum industry has manufacturing capacity to produce about 20 pct of its total volume of gasoline in the 96 to 98 search-octane range. "This would be sufficient to supply gasoline for several years production of cars requiring this type of fuel," the authors contend.

The GM engineers admitted that the production of 96 to 98 octane fuel in quantities larger than would require drastic capital equipment readjustments within the petroleum industry.

Spokesmen for the oil industry have repeatedly emphasized this point and have warned the public against building its hopes too high on the quick introduction of high compression engines. In addition, the industry proposed a study of a dual-fuel system in which the carburetor would be supplied with both high and low octane gasoline. The high octane fuel would be used only when the throttle is open wide enough to require a high grade fuel. In this way the petroleum industry believes it may be able to greatly extend the usefulness of limited quantities of high octane gasoline.

Another counter proposal to GM's high compression engine plans is the proposed injection of methyl alcohol, water and tetraethyl lead. This would require installation of a supplemental fuel tank located under the hood of the car. The mixture would be drawn by gravity to a vacuum-controlled jet, admitting antiknock mixture at the throttle openings requiring high octane fuel mixtures.

Successful introduction of engines utilizing high octane fuel on any of these models would require much larger quantities of high octane gasoline, the GM engineers contend, hence the need for high octane fuel on a nationwide basis is inevitable as they see the present situation.

If you're having tap trouble, there's a reason and a cure



The *right* tap shouldn't fail. Tapping, above all things, should be trouble-free. If there's one part of the craft of metalworking that this country knows well — if there's one operation that's been done and redone, time and time again, in every kind of metal known to man — it's putting a thread in a hole.

We think that's the very *reason* some shops still have tapping troubles. Taps are taken for granted . . . bought casually, and with little planning.

That can be fixed. Pratt & Whitney can supply the standard or special taps you need — not offhandedly, but with real respect and understanding of the job. If you let Pratt & Whitney's tap engineering service analyze your various jobs and recommend the tap design *and* tapping procedure, your tapping worries will vanish.

For the *right* tap shouldn't fail.

We know what we're talking about. Ask for proof.

PRATT & WHITNEY
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Pratt & Whitney Tap Engineering

P&W Taps include all types and sizes



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P&W Taps contain only top-quality steel made to our exact metallurgical specifications and subject to rigid P&W metallurgical department inspection. This top quality is maintained in tap design . . . heat-treatment . . . finishing . . . inspecting . . . to insure the best in Tap Quality for your use. P&W Taps and quality are synonymous.

As in the case of every important development, the report concludes, this will take time, especially since time will also be required to assure availability of the proper fuels.

* * *

PARALLELING its work with high compression engines, General Motors is moving forward with its automatic transmission plans. This week GM announced a new unit of the Detroit transmission division containing about a quarter million square feet of floor space will be built soon on Plymouth Road between Middlebelt Road and Inkster Road outside Detroit.

For the present, the new unit will function as a feeder for the main GM transmission division located in Detroit. At the present time, this division is producing 2000 units per day for Cadillac, Oldsmobile and Pontiac.

GM officials have explained that more than 900,000 hydramatic transmissions have been built since this unit was introduced 9 years ago.

Early this year, Pontiac adopted hydramatic for the first time. Reports indicate that the demand for Pontiac units far exceeds the present supply. A few months ago there were reports of requests for quotations from GM Transmission Div. for a number of new machine tools. This program was shelved several months ago, and little has been heard from it since that time.

GM has disclosed that the main

manufacturing section of the new building will be one story construction with two stories on the front to accommodate offices. The new plant will include a modern plant hospital, cafeteria, locker room, and a large parking area. It is expect-

Detroit

• • • For the second time in 60 days, Chrysler has raised the prices of all its models. The increase ranges from \$58 to \$98. Plymouth, Dodge, DeSoto and Chrysler prices are affected.

The company ascribes the higher costs to soaring prices for basic materials, transportation and other materials.

The previous price advance on June 22 raised Chrysler prices from \$75 to \$131.75.

ed that 1500 workers will be employed in the new plant.

THIS week there were also reports that a substantial tooling program is under way at the transmission division at Saginaw. Most sources believe this is an automatic transmission unit of the torque converter type, possibly for Chevrolet.

With the simultaneous announcement of increased facilities for building transmissions of the hydramatic type and the request for quotations for machine tools required to build torque converter transmission units, observers here were wondering which type unit—

the hydramatic or the torque converter—would eventually prove to be the most popular. Inform sources believe that GM has ready made plans to convert present hydramatic plant over case the torque converter transmission eventually dominates the field. Experts here believe such switch could be made without great difficulty.

* * *

ANOTHER significant expansion program in the auto industry is a half million dollar openhearth slag and skull cracker building being erected at Ford's Rouge plant. This building is 550 ft long and will be built in two sections. The section used to crack skulls from the bottom of slag ladles will be 175 ft long, 90 ft wide and 104 ft high.

The slag section of the building will be 380 ft long.

Ford's present practice is to cut skulls to pieces with an acetylene torch. The new operation will utilize a 40-ton magnetic crane to lift a 15-ton steel ball 90 ft into the air.

Ford proposes to use a 350 ft long pit, 56 ft wide and 10 ft deep which will be filled with slag from the openhearth. The slag will be sprayed with water to break it into small pieces.

The operator controlling the flow of the water will be enclosed in a small steel-plate cupola. Ford will scoop the slag out of the pit in railroad cars and sell it as road ballast. It is expected the new building will be completed by the end of November.

Reports have been heard that Ford is also proposing the installation of new equipment to supply all its demands for welded tubing.

MODERN PLOWJOCKEY: Willys-Overland's new aluminum Jee-CAB lends a modern touch to the age old job of turning over soil. And it makes the job much more comfortable because it is designed with two-way insulation to provide protection from the heat of the summer sun.



Chrysler Earnings Drop

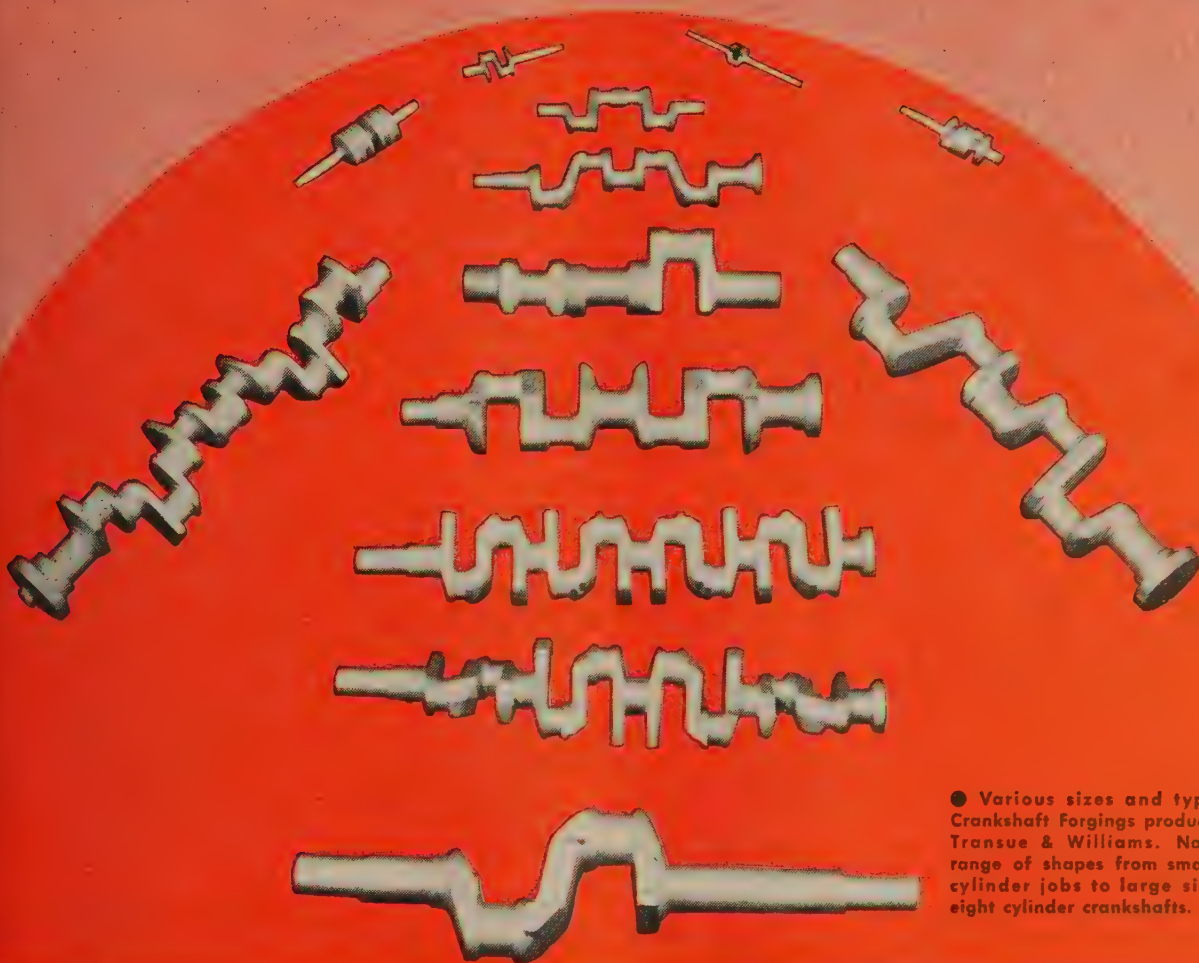
Detroit

• • • Chrysler Corp. earned a 4 pct drop on its gross sales of \$28,409,309 during the first six months of 1948, according to K. T. Kellogg, president of the company.

During the corresponding period of 1947 Chrysler earned \$35,184,844.

Unit sales of cars and trucks during the first half of 1948 totaled 439,159 vehicles compared with 460,252 a year ago.

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OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE
THE IRON AGE, August 26, 1948—103

• Defense program re-
vives aircraft industry
. . . Little increase in
production seen this
year . . . Reopening
plants, recruiting labor,
securing materials tend
to delay extra output.



WASHINGTON — Authority granted by Congress looking to the establishment of a 70-group Air Force has given a badly needed shot in the arm to the aircraft industry. As it stands, the defense program assures the industry a cushion of military orders which eventually will call for 110 million lb of airframes annually.

Already the makers of planes, components and parts have \$2 billion worth of orders in their pockets, representing some 46 million lb of aircraft. They are lifting covers from stored machinery and equipment, reopening recently idle departments, and reactivating government standby plants.

However, rejuvenation of the battered industry will be a longer, tougher process than appears on the surface. It will be many months before the dividend checks begin to roll in for those who recently hustled to buy aircraft manufacturing stocks when the program was announced.

Even the most optimistic government sources believe it will be sometime next year before there is any substantial increase in the cur-

rent rate of aircraft production. Several months will be needed for the industry to get its second wind.

This will consist of completing unfinished development work and getting together the necessary manpower and materials. While the overall manpower requirements are relatively small, the type of labor demanded is also in heavy demand by other industries.

In addition to a need for skilled mechanics, the engineering and technical departments particularly need new blood. With the decline in postwar production, this personnel drifted away and was absorbed by other industries. While the aggregate manpower needs for the expanding program is not a relatively high figure, aircraft builders will have to bid against other manufacturing groups.

THE fact that the industry was of top importance to waging the war caused it to be one of the hardest hit and the quickest to feel effects of government purchasing cutbacks at the end. It was producing at an annual rate of 1 billion lb of airframes at the peak of the war effort in 1944; it was employing more than a million workers at the time to do the job.

By the end of 1947, aircraft output had taken a nosedive to about 20 million lb and aircraft payrolls had been reduced to about 161,000 workers by the beginning of 1948.

Reports by the Bureau of Labor Statistics hold out little hope of recruiting new workers from the ranks of the unemployed. There is but little skilled labor to be found in this pool of less than 2½ million; a substantial portion of the total is what is generally termed normally unemployable.

As for recruiting labor from other industries, reports by the U. S. Employment Service indicate that the prospects are best in some sections of the Southwest and West Coast. Field office surveys show a very tight situation in the aircraft centers of the industrial Midwest, particularly around the Great

Lakes region and the middle Atlantic area.

IT is in these areas that considerable expansion is planned. For instance, the Munitions Board authorized the Navy and Air Force to activate several standby plants or portions of plants in connection with their joint air program.

Among these are to be found a portion of the Wright plant at Lockland, Ohio, the Ford worth plant at Washington, Ill., and the former Boeing assembly facilities at Wichita, Kansas.

The North Shop of the Lockheed plant is to be taken over on lease by General Electric which will produce jet engines. Emerson Electric will take over Washington Park facilities for manufacture of fire control systems for the big bombers. It is presently planned for Boeing to convert Wichita assembly works from former production of reciprocal engines to manufacture of jet engines.

Reports by field offices of the U. S. Employment Service indicate that the labor situation is very tight in both the Chicago and most of Ohio. The outlook for Wichita is a little brighter. The USES reporting a small, spotty labor surplus in that area. Thus, the major source for recruiting labor for these and other expanding aircraft works in these areas would apparently lie with other industries.

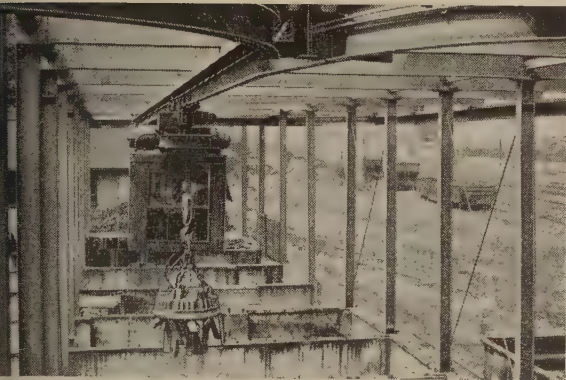
On the other hand, the U. S. Employment Service indicates, in some parts of the West Coast, particularly in the San Francisco and Los Angeles areas, there is a substantial surplus of labor and recruiting there should not be difficult.

AS in the case of labor, the supplies of basic materials are tight. Like manpower requirements, the aggregate needs are large as totals go. But any increase in demand serves to emphasize current shortages, especially aluminum and steel.

In the case of aluminum, pro-

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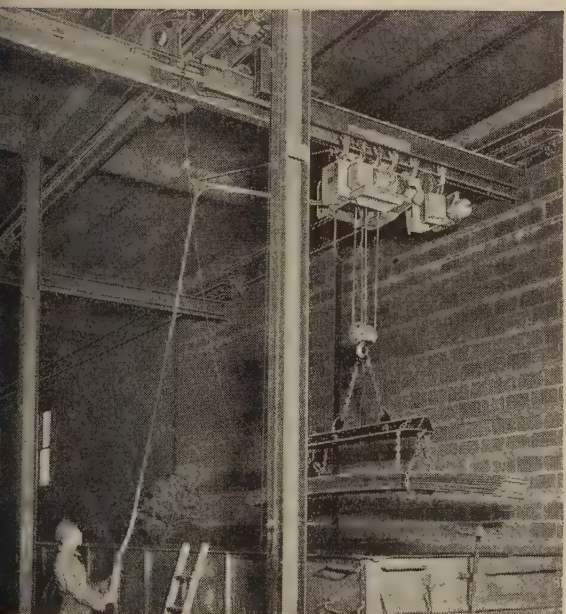
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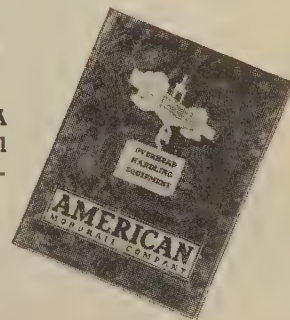
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THE IRON AGE, August 26, 1948—105

tion has been declining in recent months. Increased needs for aluminum will make new demands upon local electric power facilities which, in most cases, are now overloaded by rising postwar demands.

There is no question, however, as to the filling of defense orders once the aircraft industry gets set to meet the new requirements. Industry has so far been able to work out reasonably satisfactory allocations of metal for essential needs. In any event, other industries must pay the penalty for defense so long as shortages last.

WAA Sells 2 Plants

Washington

• • • Sale of 2 government surplus war plants has been negotiated by War Assets Administration which is turning over to the Bendix Aviation Corp. two aircraft parts plants located at South Bend, Ind.

Erected by the government at a cost of about \$1.6 million, they were acquired for slightly more than \$1 million cash. They were operated by Bendix during the war.

Committee Feels Italy And Britain Need Bulk of Bizone German Scrap

Philadelphia

• • • The intergovernmental scrap study committee of the United Nations Economic Committee for Europe has returned from its initial visit to Europe convinced that Bizone German scrap is needed for the steel industries of Great Britain and Italy, but that there may be an exportable surplus from one or two of the other five claimant nations, according to Hiram Winternitz, Jr., representative of the U. S. government on the committee.

The committee is studying the scrap needs and resources of Great Britain, France, Italy, Belgium, Czechoslovakia, Switzerland and Holland to determine how much Bizonal scrap would be necessary to foster steel production by those countries, while husbanding the balance for the needs of the United States industry.

During its recent trip, the committee visited England, France and Switzerland. Further meetings of the group are expected to be held abroad in September and October when studies will be made of the

scrap needs of the other claimant nations.

Recommendations for allocation of Bizonal scrap will be made to the committee to the American Military Government. Consideration will be given to the proportionate rate of steel production in each country as affected by coke allocations from German coal now under consideration by the steel committee of ECE. How these coke allocations will affect scrap requirements is yet to be determined.

Control is exercised over Bizzone scrap, privately owned, by the Joint Export Import Authority of the Bizzone Military Authority which has established the price of prepared scrap at \$26 a gross ton, f.a.s. German ports.

New England States Plan Scrap Drive For Sept.

Boston

• • • Plans for a united New England scrap drive beginning Sept. 7 were announced after a meeting of five New England governors and Lt. Gov. Arthur Coolidge at Stowe, Va., recently.

The governor's conference took action when they were informed of the pig iron shortage in New England because of the closing of the blast furnace at Mystic Iron Works, Everett, Mass., the major supplier of pig iron to New England foundries.

Richard C. Cooke, Boston, an industrial magazine publisher, was named to head the drive.

The conference announced that "New England factories employ 350,000 skilled workmen are threatened with unemployment in 1948 because of the continuing iron and steel shortage.

R. B. Wallace, New England representative of Bethlehem Steel, told the conference "because of emergency conditions, we have arranged to step up our shipments to New England."

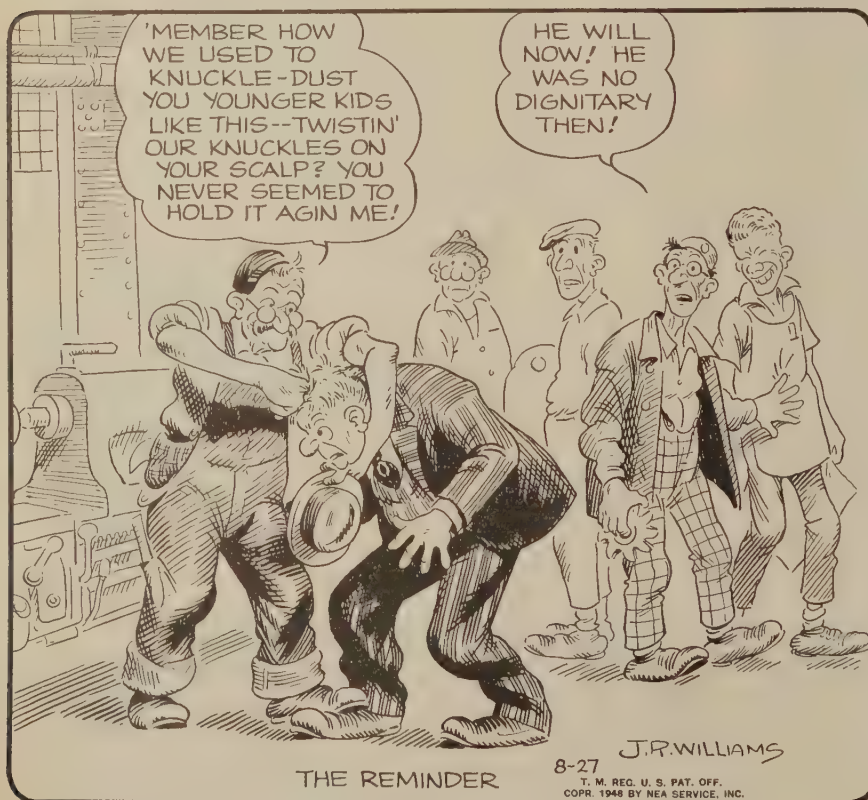
Named On Advisory Board

Boston

• • • Patrick F. McDonald of McDonald Steel Co., South Boston, has been appointed by Gov. Robert F. Bradford of Mass. to the advisory board for the division of small business in the Massachusetts Industrial and Development Commission.

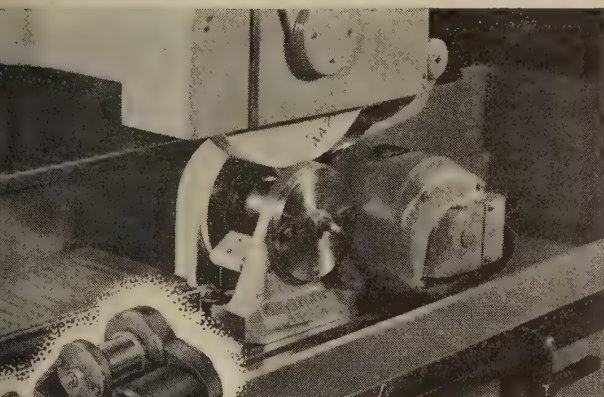
THE BULL OF THE WOODS

BY J. R. WILLIAMS



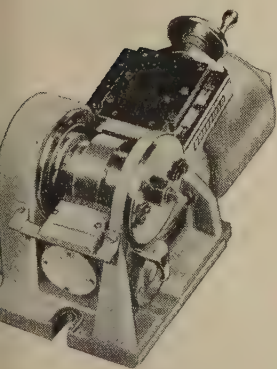
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• To take it or leave it is question faced by users of Kaiser steel as they ponder price increases . . . Puget Sound area industry reacts to clamor of rattling swords.



LOS ANGELES — Any hope which steel users in this area may have had that Kaiser Co., Inc., would not make good on its threat to increase prices on the average of \$30 per ton Aug. 15 because the steel committee of the Western States Council had appealed to the RFC for a moratorium was short lived.

When customers received the new prices Aug. 16 they found increases ranged from \$15 to \$32 per ton and that they were being asked to pay the highest mill prices in the United States for those products produced at the Kaiser plant at Fontana, Calif.

In the trade here it was generally conceded that the appeal made by the steel committee and the Los Angeles Chamber of Commerce was little more than a gesture because as long as the Kaiser organization fulfills its obligations as a debtor to the RFC the latter organization would have little if anything to say about the management or its policies.

Unquestionably many steel fabricators face the alternate of paying higher prices and hoping that they can pass a major part of the increase along to their customers; going out of business; or finding new sources of supply. While quotations from steel buyers are al-

most impossible to get, most of them indicate that they will explore all three of these possibilities. Despite the protestations of these buyers against the high prices they find themselves trapped, and with heavy investments and large market opportunities realists believe very few if any of them will close up shop.

Undoubtedly the first effort will be made to secure sources of supply other than the Kaiser Co., but in the event of failure in this direction, selling prices will undoubtedly be adjusted in an effort to recapture as much of the added raw material cost as possible. With Kaiser selling plates f.o.b. Fontana at \$116 per ton, users of this material can afford to go far afield, pay the freight and still get delivery at comparable prices. However, it is admitted that this is easier said than done in a seller's market.

Geneva Steel Co., the second closest source of plates and structurals, is booked solid well into the foreseeable future and has been able to offer no encouragement to the sources of potential customers who have kept the telephones and wires busy since the new prices of Kaiser were announced.

INDICATIVE of just how tight the sheet steel market is locally is a recent price list issued by a jobber in which, for example, 20 tons of 16-gage hot-rolled sheet 36 x 72-in. are being offered at \$330 per ton; 13 tons of 22-gage hot-rolled sheets 36 x 120-in. at the same figure; and 75 tons of 26-gage galvanized corrugated sheets, 27½ x 93-in. at \$300 per ton. It is interesting to note that some offerings are down to units of one and two sheets. The price list includes the interesting note, "the prices are not cheap, but the steel is here."

Despite the gloomy steel situation locally, business leaders continue to be optimistic over the immediate future for the war-boomed industry in southern California.

Allen Walgren, head of the small business division of the U. S. Dept. of Commerce for the southern California area, told THE IRON AGE that the small industries which

have proven flexible enough to remain in business up to this time will stay and reap increased profits during the next few years.

"The stimulant of the European Recovery Program and the available contracts from aircraft manufacturers, expected to reach the industry in increased numbers, will fall, have brightened the picture. Contrary to many wartime estimates 3 years ago, most of the war-born industries are here to stay," Mr. Walgren said.

He indicated as other stimulants the steady flow to the area of new industries needing subcontractors, a 40 pct increase in population, and a developing export market. He saw trends toward more shipping of durable goods to the South Pacific, with a specially active market to develop in the Netherlands Indies.

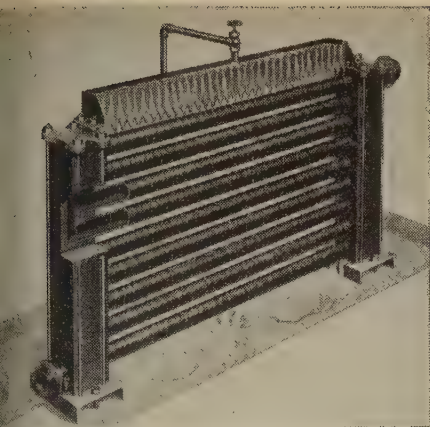
Supporting the contention of Mr. Walgren was an announcement by the Los Angeles Chamber of Commerce that \$5,308,000 worth of new production facilities was added to the county's manufacturing strength in July, sending the month total for this year to \$74,500.

Fourteen new plants representing total investments of \$1,470,000 were announced last month. Two others are being expanded, requiring an outlay of \$3,830,000. The total surpasses July 1943's 28 pct and creates 1240 new jobs. Frank N. Bush of the chamber's industrial development committee estimates.

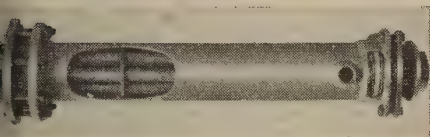
Surveys by the U. S. Census Bureau show that the residents of the Los Angeles metropolitan area engaged in manufacturing now pass the 420,000 mark, more than twice the number shown in the 1940 census.

CALIFORNIA labor statistics bulletins indicate that there have been few casualties in the industries of nonferrous metals and steel, machinery manufacturing and auto equipment during the past year.

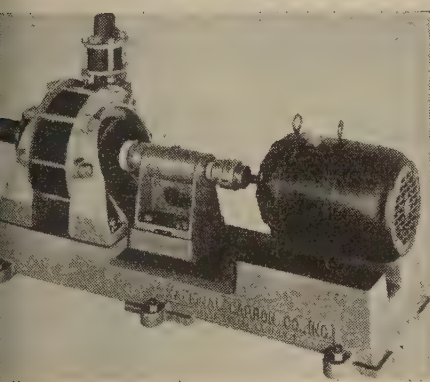
The iron and steel industry's general shows a 5 pct increase a year ago with slight drop



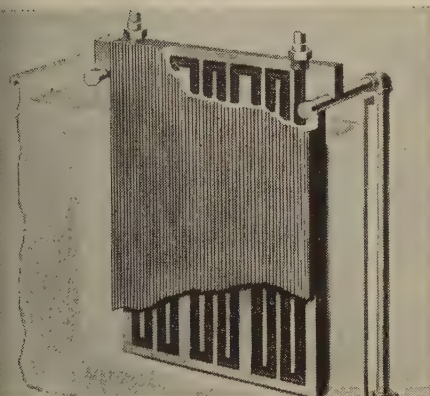
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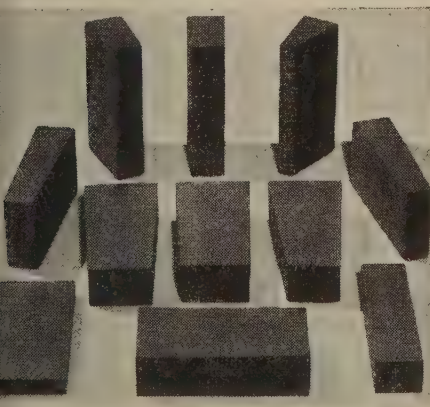
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corded in heating and plumbing supply factories and in structural steel work but with 15 pct gains shown by iron and steel foundries. All are well over the 1940 mark. In the class of nonferrous metals and their products, there also was a 5 pct gain, 55 pct over the 1940 mark.

Facilities of the Stanford Research Institute, a nonprofit agency devoted to solving research problems of industry were extended to Los Angeles this month as an important step in strengthening southern California industry.

The institute was organized in November 1946, with headquarters in Palo Alto, Calif., under the direction of Dr. J. E. Hobson to provide applied research service for Pacific Coast industry. In the new Los Angeles division, the aim announced will be to "speed and improve local manufacturing."

Dr. A. M. Zarem, 31-year-old former chief of the electrical section in physical research at the U. S. Navy's Pasadena Ordnance Test Station, will be the head of a staff of 15 at the Stanford Research Institute's Los Angeles office. The scientist is the inventor of the famed Zarem camera, which has made possible much of the "micro-time technique" in testing Naval ordnance.

The work done by the SRI differs from that at colleges like Caltech nearby in that it specializes almost solely on research services director toward business and productive effort rather than more "pure science."

Typical Los Angeles industrial projects, Dr. Zarem reported include cause, sources and possible controls of smog; economic aspects of aircraft industry expensibility in an emergency; and evaluation of detergents. Other interests include radar and television design and development, soil conditions, high speed photography, petroleum chemistry and technical developments in industry.

To place the institute on a profitable basis a million dollars in contracts is needed annually. Originally, this mark was expected to be reached in 1950, but early indications from Los Angeles industry are that the goal will be reached next year, Dr. Zarem said.

SEATTLE—Rattling swords in loosened sheaths throughout the world have once more awakened

the dozing Pudget Sound Naval shipyard at Bremerton where at least 1500 additional workers are expected to bring the total work force to well over the 10,000 mark.

Conversion work on an Essex class carrier and on two landing ship docks is getting under way. These docks are to be used in the Arctic as a part of the program for stiffening the northern defenses of this country. While operations have been on a one-shift basis it is entirely likely that a second shift will be put on soon to complete the conversion work on the carrier as quickly as possible. A scarcity of trained men has tended to hold down the hiring rate although the strike of the aeronautical union at the Boeing Airplane Co. provided an unexpected labor pool.

While businessmen of the Pudget Sound area are more than happy to see Seattle again building up as a defense center, with more work flowing into Boeing and the Navy yard, the war conscious citizens are wondering what will happen if war should come. The state of Washington is building up into a prime target for an enemy.

Within the state borders are the Coulee Dam, the country's only B-50 production line, the Navy atomic factory at Hanford, Grand yard and a port that is the main entrance to Alaska.

With industrial activity on a rising tempo, considerable concern is shown over a possible power famine in the land of plenty. Leading power authorities at the annual meeting of Northwest Public Power Assn., held recently at Port Angeles, Wash., warned that there was a strong possibility of a shortage of electric power in the near future.

An actual power shortage may well be facing the Northwest this winter and the situation may grow more serious in 1949 and the early '50's. The worst point is expected in December of 1951, according to the report of the Pacific Northwest utilities conference. It will probably be necessary to ask all users of electricity to cooperate in conservation measures according to members of the conference.

How does this situation exist in the Northwest with Grand Coulee Dam to supply its power and where there has been talk of routing electricity to California which is already hard hit for power?

GUS NORWOOD of Vancouver executive secretary of the association, tried to answer the questions. He stated that at present only half of the scheduled generators are in operation at Coulee. "It is true," he stated, "the new generators are on the way. Coulee (there will be three in year 1949, 1950 and 1951, to make a total of 18). But the use of the additional generators exclusive of numbers 10, 11 and 12, depends on the proper control of the Columbia River water flow. Coulee Dam alone cannot do the job of running all 18.

"Montana's Hungry Horse dam due in December 1952 will level the Columbia flow sufficiently for the operation of 15 Coulee generators. But that is still three short of the Coulee capacity. Other dams are needed.

As for the possibility of routing electric power to California, Norwood stated that the Northwest has an acute daytime shortage when industry's demand is heavy. However, a power load is going to waste at night in the off-peak hours and over the weekends. Apparently the only hope of diverting any power to California would be through which is otherwise wasted. Members of the association were unanimous in their opinion that continuous pressure must be exerted on the 81st Congress to secure adequate appropriations for additional dam generating plants, transmission lines, etc. On hand at the meeting to warn the delegates that the public power program "faces a real present danger in the coming session of Congress" was representative Henry Jackson, Washington lone Democratic congressman. He particularly warned that the danger to public power will come in the form of riders in appropriation bills.

Future plans for the development of Northwest power were revealed by Col. Theron Weaver, division army engineer, who indicated seven million additional kilowatts of power could be developed from the Columbia Basin.

An engineering report to be completed this fall after 5 years of study will outline the best developments for the basin for the next 20 or more years, according to the colonel. Scores of dams under consideration for inclusion in this program and more than a thousand dam sites have been investigated.

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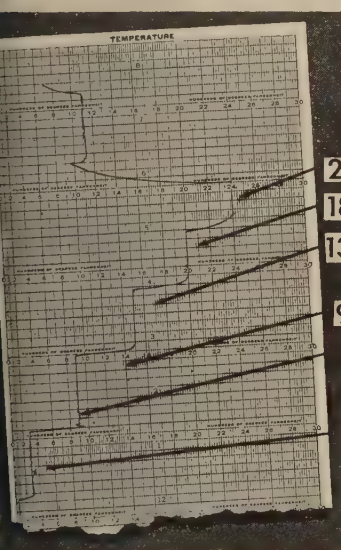
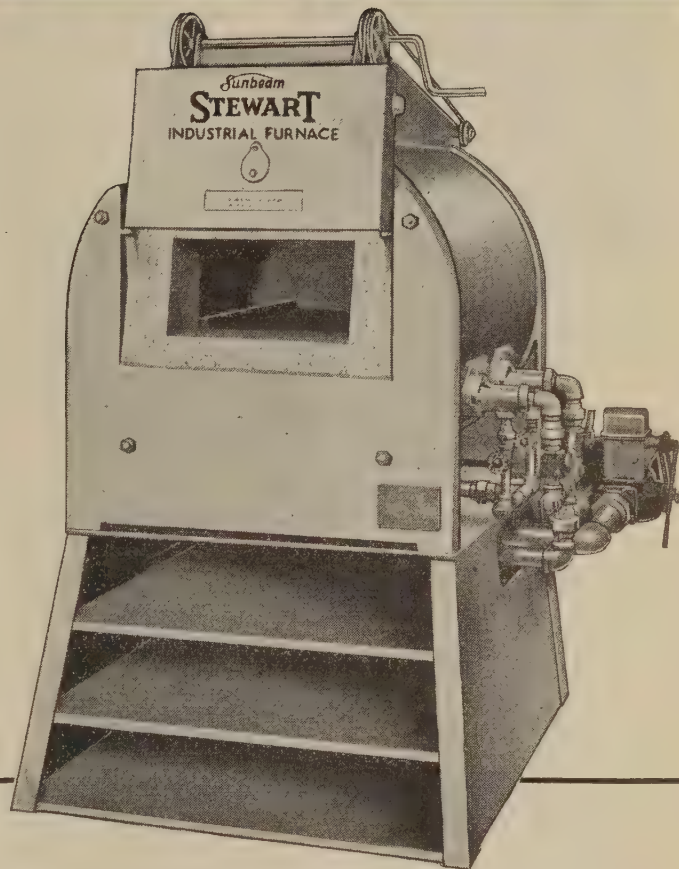
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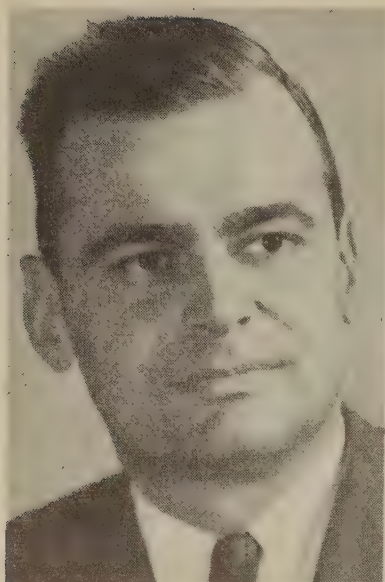
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PERSONALS

• • •



PETER TELFAIR, sales and technical development head, Zirconium Div., F. W. Berk & Co., Inc.

• **Peter Telfair** has joined F. W. Berk & Co., Inc., New York, as sales and technical development head of the company's newly-formed Zirconium Div. Mr. Telfair was formerly associated with the sales department of Bethlehem Steel Co., Inc.

• **G. L. Harman, Jr.** has been appointed manager of the Milwaukee Branch office of Bailey Meter Co., replacing **R. V. Knapp** who resigned to accept a position with Mosinee Paper Mills Co., Inc. Mr. Harman has been associated with Bailey Meter since 1937. For the past few years he has been attached to the Los Angeles branch office.

• **L. J. Firth**, in addition to his duties as president of the Firth Sterling Steel & Carbide Corp., McKeesport, Pa., has been named director of technical development. **W. J. Loach** has been appointed manager of carbide development and quality control; **Charles W. Iams, Jr.** has been made manager of carbide production and fabrication at the McKeesport plant; **E. G. Moffat**, works manager of the corporation's recently completed plant at Milford, Conn., and **A. B. Vestal**, superintendent of plant engineering at McKeesport.

• **Joseph L. Hegener** has been appointed secretary-treasurer of McCulloch Motors Corp., Los Angeles. Mr. Hegener formerly served as comptroller of the company.

• **Arthur C. Wheeler** has been elected president, Seymour Mfg. Co., Seymour, Conn. **Alton G. Wentworth** has been named executive vice-president. **Bernard H. Matthies** and **Earl B. Boise**, vice-presidents; **Harry A. Leigh** secretary and treasurer; **Charles Wohlfarth**, assistant treasurer; **Robert W. Brown**, assistant secretary.

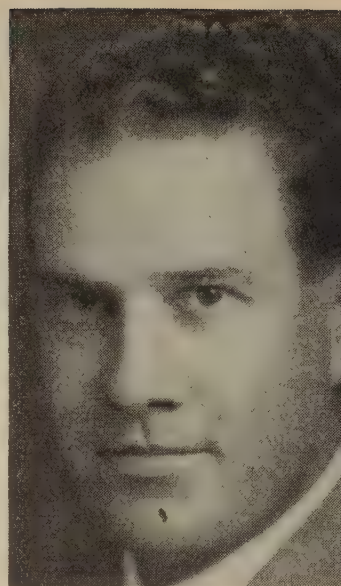
• **Ora E. Clark** has been appointed general superintendent of the Hamilton plant of Armco Steel Corp., Middletown, Ohio, succeeding **J. S. Ferguson**, who has been named technical director of the newly-formed Argentine division of the Armco International Corp. **John Poast** has been made blast furnace superintendent succeeding Mr. Clark.

• **Fred L. White** has been made development and consulting engineer and **John E. Callouette**, chief engineer of the Osgood Co., Marion, Ohio. Mr. White joined the Osgood Co. in 1917 as engineer and draftsman and was appointed chief engineer in 1937. Mr. Callouette, who succeeds Mr. White, has been associated with Clark Bros. Corp. and Industrial Rayon Corp.

• **James E. Allen**, for many years executive vice-president of the Aro Equipment Corp., Bryan, Ohio, has resigned to start his own business on the West Coast, representing several lines of industrial products for manufacturers in various parts of the country.

• **Robert H. Groman** has been appointed to the board of regional sales supervisors, Eutectic Welding Alloys Corp., New York, covering the west central area of the United States. Mr. Groman has been assistant to the general sales manager.

• **W. L. Manly** has been appointed manager of dealer sales of the Allis-Chalmers Mfg. Co., Milwaukee, succeeding **W. A. Meyer** who has been named assistant manager of the Texrope Drive department. Mr. Manly joined the company in 1937, serving in the water conditioning department where he has been manager since 1942. **T. J. Hodan** has been appointed to succeed Mr. Manly.



J. C. BIGHAM, district manager of sales, Latrobe Electric Co.

• **J. C. Bigham** has been appointed district manager of sales in Philadelphia and **R. C. Kohl** district manager of sales in Buffalo. **J. C. Bigham** has been a sales representative in the company's Detroit and Mr. Kohl has served in the same capacity in the Buffalo with headquarters in Cleveland. **T. J. Bridgeman** has been transferred from the company's Chicago district to the Detroit district. **L. C. Hansen** from the cast division to tool steel sales in the Chicago area.

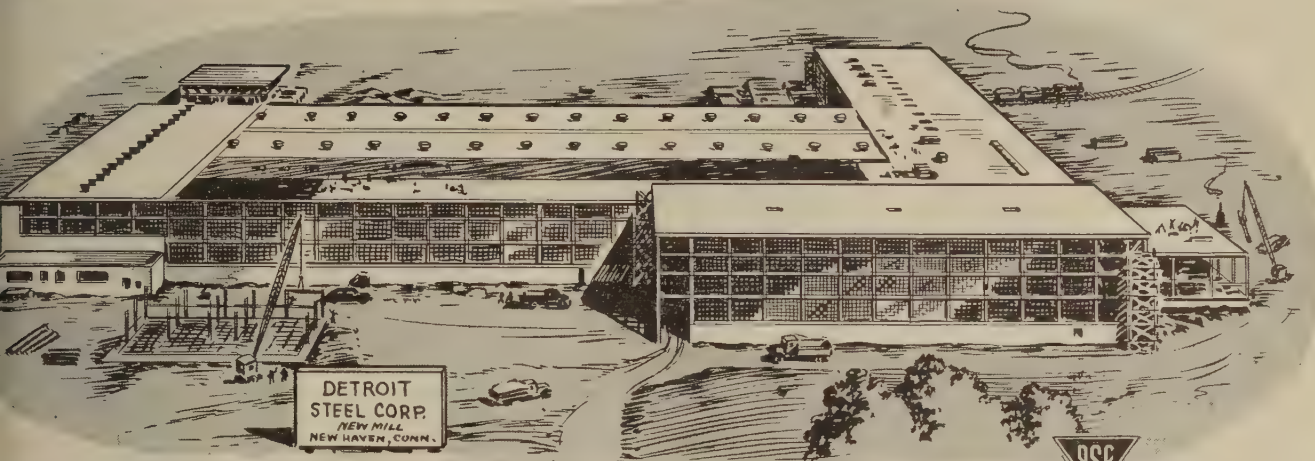
• **Eugene K. Graham** has been named assistant to the general superintendent of the Fairfield Iron Works of the Tennessee Coal, Iron and Railroad Co., Birmingham. **James C. Gray** has been promoted to assistant manager of raw materials and **Ellwood B. Nelson** has been advanced to general superintendent of the coal mines division.

• **J. A. Greenland** has been named district manager of the Seattle office of De Laval Steam Turbine Co., Trenton, N. J. Mr. Greenland joined the company in 1938 and has been associated with the Seattle office since 1940.

• **Ercell R. Stevens** has been appointed abrasive grain engineer of the Chicago district for the Norton Co., Worcester.

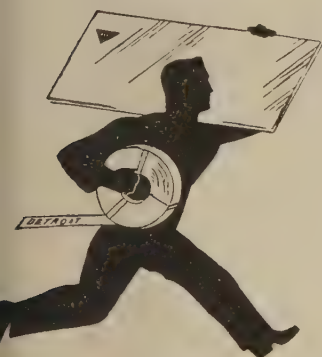
(CONTINUED ON PAGE 144)

MORE STEEL COMING FOR DSC CUSTOMERS



ACTUAL SKETCH OF PLANT AS PARTIALLY COMPLETED AT THIS TIME

Here's How We're Going to Have More Steel for You



Now under construction . . . a big, new cold rolled strip mill in New Haven, Conn., scheduled to begin rolling by January 1, 1949 . . . to give Eastern customers 60,000 tons additional producing capacity . . . practically at their stockroom doors.

Improvements at our Detroit Mill to step up that unit's producing capacity to 150,000 tons a year . . . to increase the supply of cold rolled strip available to Midwestern customers by about 35,000 tons a year.

And D. S. C. Reminds You . . .

That our Detroit mill . . . our Reliance Division network and our Craine-Schrage Steel Division will continue to do everything possible to keep your production rolling . . . giving every account equitable consideration . . . constantly planning and working toward greater production and supply . . . and towards higher standards of steel service.

**Indefinite Dan Our Customers' Man-
tes Correspondence Regarding
Your Normal and Regular
Requirements**

ly, we may be unable to accept business now, but looking ahead, would like to keep you informed of our expanding facilities.

DETROIT STEEL CORPORATION

PRODUCERS OF
COLD ROLLED STRIP STEEL

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RELIANCE STEEL DIVISION

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DISTRIBUTORS AND DIRECT MILL REPRESENTATIVES:

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European Letter . .

• UN outstanding in relatively few strong forces for world peace and order . . . Over wide range of social and economic activities solid progress shown by report of Secretary-General . . .



LONDON—The publication of the Secretary-General's latest report on the work of the United Nations comes at the end of three years of troubled and frustrating existence. It is useless to pretend that the organization is doing the work its sponsors mapped out for it. In fact, UN is not assuming the functions of an embryo world government. The conditions for these things are, as Mr. Trygve Lie freely admits, simply non-existent. The division between East and West has grown steadily worse. Far from there being a peace treaty for Germany, the conflict over Berlin has carried the Great Powers to a new pitch of hostility. Far from there being a Far Eastern settlement, war continues in China and Indo-China, and there is a fierce undercurrent of violence in Burma, Malaya and Indonesia. As for the more distant prospect of peace, all expectations of disarmament have faded into an invisible distance. The Commission on Atomic Energy has decided to suspend its sessions in fact of constant failure to agree with the Russians on any point. The hope of a United Nations is contradicted at every turn by the fact of a disunited world.

No one will deny the unfavorable background. But how many people

will agree with the Secretary-General when he claims that the time has come to stop blaming the United Nations' inadequacies on the situation in the world at large, and that instead the United Nations must be upheld and applauded as the chief agency making for order and peace? If the general public were asked to give a composite picture of their idea of the United Nations, they would describe a welter of reports and surveys, a mad round of conferences and commissions, the whole crowned by Mr. Gromyko saying "No" in the Security Council.

BUT, over a wide range of economic and social activities the United Nations has made solid progress. The work of the Economic and Social Council and its subordinate agencies is worth an article to itself. Here it is sufficient to refer to its essential task in collecting and publishing world statistics, the start it has made in bringing out valuable studies of world economy—the report on economic conditions in Europe published by its Economic Commission in Europe was a model of its kind.

Since the danger of war is the

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nightmare hanging over the unhappy world, it is by its success or failure in preventing conflict that the usefulness of the United Nations must ultimately be judged. If it is one of the elements in the world lessening hostility and postponing irrevocable resorts to force, then its rising budget and the \$34 million spent on it in 1948 must be counted cheap indeed. And on this a good case can be presented. The forces making for peace in the world are neither very numerous nor very obvious, but the United Nations is certainly at their head. It is the only place where the Great Powers meet regularly and where, nominally, at least, they meet in pursuance of common aims. On occasions, this meeting can

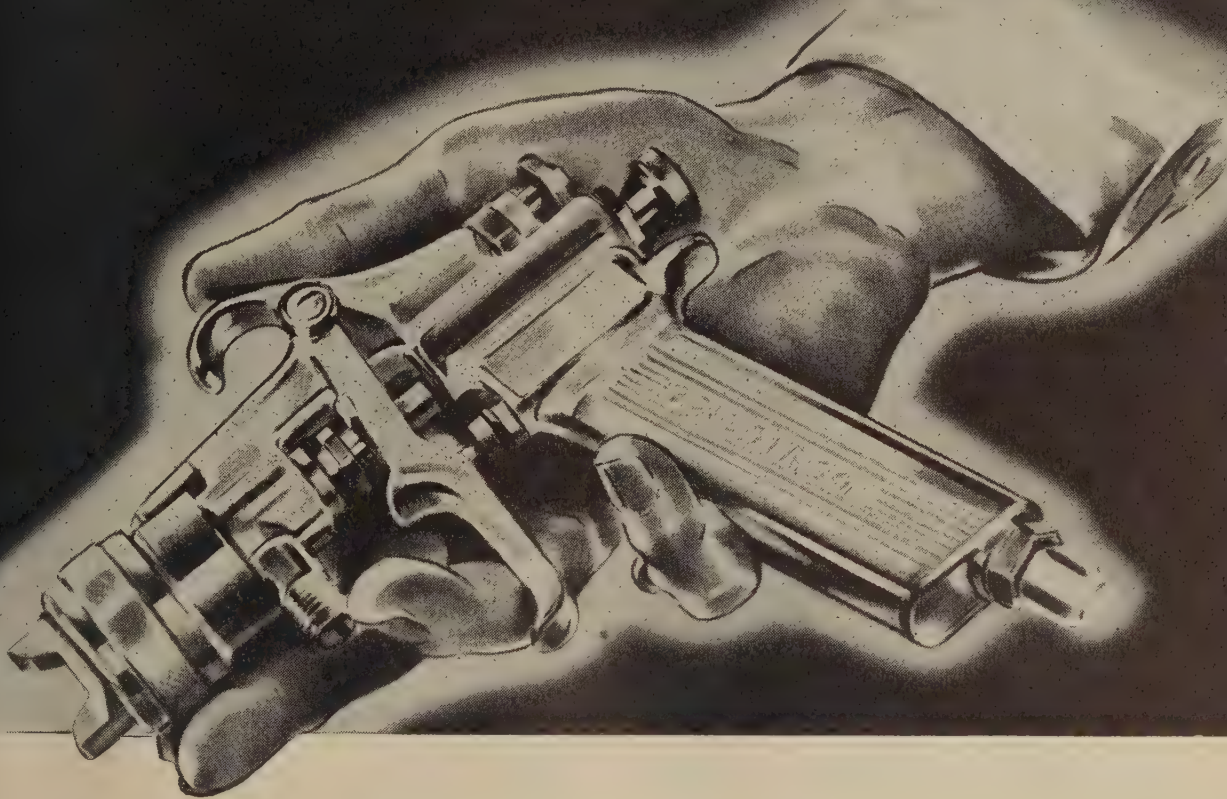
quite unexpectedly break the ening pattern of East-West sion, as for instance when United States and the Soviet found themselves together as Britain and China on the iss where, nominally, at least, Palestine. It is doubtful whether Russia would have withdrawn from Azerbaijan in 1946 if the of its presence there had not sent to the ends of the ear the sounding board of the U Nations. Similarly, the presence United Nations Commission Northern Greece and Southern rea has helped to prevent a conflict developing into a struggle.

It is clear that the Egyptian when they arraigned Britain before the Council for a breach the peace in maintaining garr in Egypt, were caught unaware the extent of the other Power's interest in the Sudan's progress towards independence. Similarly the government of India may have outraged by the amount of cooperation shown to Pakistan's demands in the debates on Kashmir; it is certainly possible that the attitude of the Security Council ultimately have a tempering on the more ardent spirits in

THE chief justification of the Security Council lies in the fact that it has succeeded on three occasions in putting a stop to fighting which had already broken out. It is beginning to evolve techniques of mediation and disputes to peaceful conclusion. But the case of Indonesia, Kashmir and Sino-Tibet, each in its way, sufficient to inflame a whole area and, if unchecked, to lead to more widespread hostilities. The mere fact of announcing a cease-fire has probably already saved the world in about terms more than the \$30 odd millions it has spent on the United Nations.

The Security Council may have completed its task and perfected its technique, but it has averted bloodshed and held untrollable hostilities in check.

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It's a DeVilbiss spray gun, heart of DeVilbiss finishing systems—ready to work for you faithfully, efficiently and economically—day after day, year in and year out.

When you put this employee on your finishing department payroll, mounting costs that plague production and curtail sales will decrease. Years of continuous spray experience in industry after industry equip this versatile worker to end costly time-consuming methods . . . to conserve man-

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Industrial News Summary...

- **Steel Industry Due For Needling**
- **Capacity Question To Come Up**
- **Ingot Output Up 1/2 Point to 95 Pct**

THE steel industry is soon to be dipped into a big political cauldron. Because it is big, basic and short of steel the industry will get the needle again—this time longer and sharper.

Some administration people are rubbing their hands getting ready to blast at steel on the question of capacity. It will be a repeat performance. No amount of proof or facts from the industry seems to stem the tirades from Washington on the adequacy of steel capacity.

Unless steel firms can do the impossible in getting their story across that (1) they are increasing capacity, (2) they are trying to fairly dish out an all-time record output of steel and (3) current conditions will not last forever, they are in for a shellacking.

These regular capacity bouts are a huge waste of time. They are plain silly. This week the industry is operating at 95 pct of capacity. It has not been able to get above this rate for months. Previous highs have been 97 pct. Even at that rate output this year will match the all-time record made in 1944 when close to 90 million tons of steel were turned out.

The simple unvarnished reason why steel output and the operating rate is not larger is because (1) good coking coal is tight, (2) ore is harder to get, (3) breakdowns are more numerous, (4) pig iron supplies are short and (5) there is no real assurance that there will be enough scrap this winter to support present operating levels of 95 pct. If the industry can not operate at the top of what capacity it has it is idle at this time to talk of a 5 to 10 million ton increase in capacity.

STEEL officials expect but do not relish these periodic rashes about capacity. They brought some on themselves by resorting to debate on need for capacity instead of showing that practically they were increasing their capacity. But as long as steel users run to their congressmen (as they do every day by visit, phone and letter) with tales of shortages and hard luck stories and as long as the election is nearby the heat will be on.

But what privately burns some steel men up is the current spectacle of Republican Senator Martin's Small Business Committee action of forming a steel inquisition. In so-called peacetimes, investigators of this committee last week were in the midst of a wild goose chase or fishing expedition—depending on what side the observer is on.

Armed with subpoenas (if necessary) and with permission (how could it be refused) three investigators of the full committee were busy firing questions at Carnegie-Illinois Steel sales officials and getting their eagle eyes on information that normally is considered

to be the company's own business—no steel company likes to tell another one where it sells its steel, how much it sells and to what kind of customers steel goes.

This junket to Pittsburgh was called a "pretest" prior to sending out questionnaires to all of the steel industry and to most of its customers. The aim was for the committee to try to find out if: (1) customers near steel mills get more steel than those far away, (2) steel company owned fabricating plants get more steel than independent companies in the same business and (3) if customers are using the steel they get "properly." Just how the "pretesting" at Pittsburgh will help on the questionnaire to be sent is clear. The official reason given is that Carnegie-Illinois and Bethlehem Steel are good sampling material—their competitors would say so, too.

• **A** CONGRESSIONAL survey a la questionnaire find out no more than: (1) many customers are not getting enough steel, (2) distribution is being made by historical purchases except where voluntary allocations prevail, (3) everyone wants steel, (4) everyone says they are not getting enough steel, (5) the effect of freight on steel selling will not be clear-cut as long as demand is so far ahead of supply and (6) steel users are quarrelsome. The loudest gets the most attention. The only difference in such a questionnaire by government is that along the line men not versed in steelmaking and distribution call the plays.

Steel output this week is unchanged from last week at a revised rate of 95 pct of capacity. It is doubtful the rate will go much higher in the near future. It is now certain that this year's output will be another peacetime record.

There was no indication that scrap prices were getting ready to decline. Offerings were meagre in some areas. Attempts were being made to batter demand quotations with no success in sight. Present prices seem to be firmly entrenched.

It is too early to be dogmatic about it but the increase in voluntary allocation is serious. The present situation has all the earmarks of early days of war when priorities were worthless. If steel companies do not go all out to fill the voluntary plan they can expect government controls no matter who is elected President of the United States.

More serious is the slow but positive way voluntary or any other priority rating system has of jamming normal steel distribution. The greater number of groups who get preferred treatment the quicker the whole allocating setup mushrooms and explodes.

MORE NEEDLES: The steel industry is getting the shells again. This time its from Government administrators who think our steel capacity is below what it should be. That might be. But it did a pretty good job during last war—in supplying us and our allies with the necessary steel to win. In war something has to give. We might want auto- electrical appliance or other luxury production to keep pace with shells and guns—but that's probable. The more capacity we have, the more shells and guns we'll make. Besides considerable expansion is in the way and being planned right now despite the high construction costs that prevail.

PRIVATE WORRYING—Some steel and industrial firms are worrying about the possibility of loss in output this winter if the weather breaks records like it did in past years. Hundreds of thousands of tons of steel were lost last winter because of gas shortages, slow coal deliveries and other weather casualties. The condition even ended to scrap, the movement of which was slowed down. If all goes normal this winter new production records will be made, if not—look for some slackening in output.

VERY CONTROVERSIAL: Sentiments are very strong about Kaiser's getting the Government blast furnace and the ovens at Cleveland. Republic has operated the plant since 1943—but will have to relinquish it on Sept. 1 if the A deal with Kaiser sticks. Tucker is a little miffed. He, along with Republic, bid for the plant, but neither high enough. Plenty of foundries in the Cleveland area are pretty worried about where they are going to get their pig iron if Republic does have to give up operation of the plant.

IS IT A THREAT: Reports persist that if steel companies do not increase steel capacity (which they are doing) that government agencies the administration will attempt to build mills with taxpayers money and lease plants to private firms. This was done in war several years ago—but that war was a fact. Steel officials could hardly foil any attempt to build mills if the government ordered it. And the public is so apathetic over the question to object until late. Some steel companies would welcome the chance to lease a new steel plant—at another location from their present one—in order to wipe out bad effects of the f.o.b. mill operation.

• HELP WANTED: It might not be that bad. But the Quincy, Mass. yards of the Bethlehem Steel Co. have received contracts for 5 more large tankers to cost about \$30 million. At present 6000 men are employed. When peak production is reached—more than 10,000 men will be employed there.

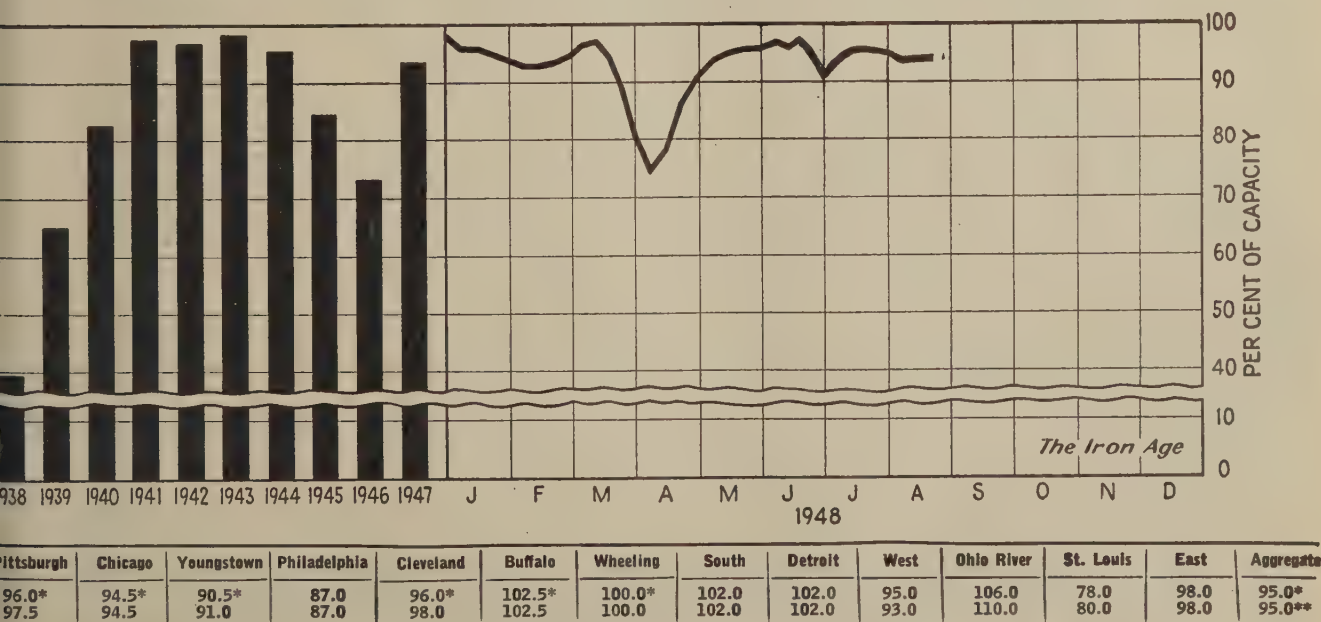
• ORE LORE: There's lots of Titanium ore up in Quebec. And this ore is rich in iron, too. So we have non-ferrous interests developing mines and refineries to get Titanium. They will also end up with plenty of iron ore—a commodity that the steel industry is in need of. The Quebec Iron & Titanium Corp., a subsidiary of the Kennecott Copper Corp. and the New Jersey Zinc Co. are going to spend \$25 million right off the bat. Eventually some \$150 million is expected to be expended in developing the ore body.

• CONFUSION: There's plenty of confusion everywhere in industries today. And its all a result of a bust up of a distribution system in a day when American industry should be decentralizing instead of getting encouragement to locate in a few spots—where steel and other products are being made. Those still selling basing points are reputed to be selling illegally. Those who have changed have felt the full impact of freight rates—and it hurts. Some are having trouble getting steel at all. There's one thing for sure—all the headaches are distributed evenly to all affected by f.o.b. selling.

• WENT RIGHT ON: Kaiser's \$30 price increase went right on as announced despite any sentiment pro or con. How the price increase will affect Kaiser in the future remains to be seen. Right now the West Coast needs steel—and consumers will pay for it, like it or not. Later will take care of later.

• DECISION REVERSED: British and U. S. Military Governments in Germany have ordered dissolved the Bipartite Control Office as exclusive agent for export sales of steel scrap. The private association of scrap dealers were well under way getting control of all contracts relating to scrap exports—apparently with the consent of both military governments. Just as they were getting started, the pegs were knocked out from under them with the more recent order.

Steel Ingot Production by Districts and Per Cent of Capacity



Quantity
PRODUCTION
of
GREY IRON CASTINGS

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY
FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE

Consumers Critical of Steels' Dropping Basing Point Selling

Chicago

Reactions by consumers to the steel industry's f.o.b. mill method of selling runs the gamut from "It makes no sense," to "It makes no sense." Some steel consumers use the industry of selling out. They hold that this action was not mandatory as the "cease and desist" order had not yet been issued, and even if it is issued as it now stands, the steel industry really was not forced to make such a broad, far reaching decision it was to make.

A good example of the effect on other industries caused by the steel industry's own decision can be illustrated from what is taking place in the forging trade. First, forgers in this area claim they are in no position to absorb any more costs than as freight. Their average net profit has been running 3 pct to 5 pct and those who make 6 pct are in the minority. Second, steel's rendering of the cause of the basing point system makes it appear that the selling system of certain types of forgings is now illegal. Third, the monopoly fences have been thrust on the forgers whether they like it or not, and this is frustration without representation in any sense of the word, forgers are.

Historically, drop forgings have usually been sold f.o.b. plant by the forging industry. This business, on a competitive bid basis, could only be handled this way as the margin between successful bidders and unsuccessful bidders amounted to 1¢ a fraction thereof per piece on parts 3 lb and under.

This is particularly true in Detroit where auto makers play the game—insistent on squeezing every penny of fraction thereof from the forgers. Today with the steel shortage a margin of 5 pct is the rule. If competitive prices on forgings are within plus or minus 5 pct of each other, Detroit buyers at the moment are considering such bids competitive with each other.

On flat die forgings or heavy drop forgings the industry has always quoted delivered prices, which is more or less a basing point system. In this field the buyers are

Forging Trade In Particular Is Peeved Over Hardships Resulting from Move

By D. I. BROWN
Chicago Regional Editor

somewhat more charitable in their dealings. Profit margins on these items are termed decent by the forging trade.

Because of these facts very few forge shops have been able to just make drop forgings. They had to also participate in heavy forgings

in order to survive. There are exceptions, where the drop forgings are the single type of product, but these shops have survived mostly because of special conditions, types of products, extremely favorable locations, etc.

Because of the manner in which forge shops must buy steel the monopoly fences are up. In Chicago a drop forger participating in local business has an advantage that cannot possibly be met by outsiders, except should the outsiders have much superior methods of manufacture and therefore lower cost than the local forge shop. The local forger most often gets his steel from local mills by truck, or at the most on a three line switch. The finished part can often be delivered again by truck or a one, two or

"Now It Starts"



three line switch. This difference in freight costs amounts to much more than the marginal difference of 1¢, or fraction thereof, formerly the practice in the competitive drop forging business.

There are cases where forgers here are making heavy forgings, the ingots for which must be purchased in Pittsburgh. In these cases local forgers do not enjoy any substantial advantage over outside shops.

If forgers have to quote f.o.b. plant prices on heavy forgings the jig is up. Each shop will find the boundary uncomfortably confining. Maybe their best customer, cultivated over the years, is outside the freight rate fence. If so this particular business relationship will cease to exist. Specialty forgings, such as piston rods, rings, shafts, etc., are sold on a flat delivered price anywhere east of the Mississippi River. This price is the same from any forge shop. Competition in forged rolls is keen and they are sold at the identical delivered price by all three makers.

Detroit buys substantial tonnages of forgings from the Cleveland and Chicago areas. Most of these forgings are drop forgings. Here again some shops are left holding the bag. Forgers in the Milwaukee, Rockford, and Tri-City areas can't compete with shops located in Chicago for the Detroit business. These outlying shops must pay the full freight line charges on steel to their shops. Local shops just pay the switch. The finished parts must then be shipped back through Chicago on to Detroit with full freight line charges all the way.

It is inconceivable that the cost conscious Detroit buyers will hold still for prices wherein these high freight costs must be taken into consideration. They'll shop around as they always have, forgers here declare. They will soon find it useless to try to bargain on prices from shops where freight rates are high. In fact, this has been going on constantly with the ascending

spiral in freight charges over the past few years.

It is expected that some forgers in Cleveland and Chicago will be able to continue doing business in Detroit. In fact, they may in some cases get more business as forgers located in Cincinnati, St. Louis, Milwaukee, etc., are automatically ruled out. Forge shops closer to Detroit will be in clover if they are making auto parts. From the table on rates it is apparent that Cleveland's present rate advantages over Chicago are probably not enough to sway Detroit buyers. In ordinary times, however, this will not be the case.

The only salvation of forgers doing auto business, who are now unable to ship to Detroit on a competitive basis because of freight, are the assembly plants. Forgers located close to assembly plants have always bought in their back yard if possible. Now this practice will likely be increased.

With every freight rate increase the natural sales area for drop forgings shrunk. The only factor which permitted some business outside that very definite area, forgers say, was that their steel was purchased on the basing point system.

This is not true of the profitable end of the business, as heavy forging sales are still on a delivered price basis in which a basing point system permits a wider sales area in which a forger can participate regardless of his location. In many cases this part of the business carried the drop forging portion of a plant's business in the past.

The theme song which has been played in drop forgings, the fortissimo of which was directly tied to freight rates, has reached crescendo proportions. If the forgers now have to sell heavy forgings f.o.b. plant the industry will again be tormented with that theme—"I told you that I love you, now get out"

Alcoa Research Director Awarded ASM Gold Medal

Cleveland

• • • Francis Cowles Frary, director of research, Aluminum Company of America, has been elected to receive the Gold Medal of the American Society of Metals for 1947, according to H. Eisenman, national secretary of the society.



FRANCIS C. FRARY

Mr. Frary received the award for outstanding metallurgical knowledge and great versatility in the application of science to the metal industry as well as exceptional ability in the diagnosis and solution of diversified problems.

Widely known for his special studies in the fields of metallurgy and chemistry, Dr. Frary has resented Alcoa in his present capacity for the past 30 years.

Buys German Scrap

New York

• • • Western Steel Corp. purchased 250,000 tons of scrap iron and steel from the German National Railways, according to company spokesmen.

This is the largest lot of scrap originating in Germany that has been sold for remelting in this country since the end of the war. It is produced by dismantling damaged locomotives, rolling stock, bridges and rails.

The scrap has in turn been purchased by Western Steel, in association with the Great Lakes Carbon Co. to Bethlehem Steel Co. Shipments are expected to begin to Baltimore shortly.

Acquires West Coast Plant

Los Angeles

• • • Cutler-Hammer, Inc., acquired the business of the Electric Products Co. here, according to W. G. Tapping, Cutler-Hammer district manager, who will be in charge of the new plant.

Rapid industrial expansion in this area and the increasing demand for electrical apparatus in this territory influenced Cutler-Hammer's decision to make the acquisition.

RATES ON ROUGH STEEL FORGINGS

Cents per 100 lb

	Truck	Rail
Chicago to Detroit	t.t.l. 90¢ less than 5000 lb	t.c.l. 75¢
	70¢ 5000 lb min.	.....
	t.l. 34¢ 20,000 lb min.	c.l. 44¢ 40,000 lb min.
Cleveland to Detroit	t.t.l. 79¢ less than 5000 lb	t.c.l. 62¢
	59¢ 5000 lb min.	.....
	t.l. 28¢ 20,000 lb min.	c.l. 34¢ 40,000 lb min.

Steel Distribution Picture Shows Little Change in Detroit But . . .

Detroit

• • • Sweeping changes in steel distribution practices expected to follow as a result of upsetting the basing point system haven't happened in Detroit—yet.

Steel buyers here are naturally hanging on to their established steel supply lines—and hoping suppliers will not change their customer lists. Steel suppliers, if they are actually contemplating radical revisions of their customer lists, are not showing their hands.

The consensus here is that the predicted changes in steel customer lists will not occur until it is established by legislation or otherwise that the basic point system must go. Even then, it is believed that both steel buyers and sellers will move slowly in adjusting to the new conditions.

As pointed out to THE IRON AGE, the steel buyer is in no position to change his steel sources now and, with the steel buyer in this predicament, the steel seller will not necessarily have to move slowly if he is to avoid sharp criticism by anxious buyers.

An immediate result of the upset in the multiple basing point system has been a flood of inquiries from local steel buyers asking if their steel quotas cannot be raised now that it is no longer necessary to absorb heavy freight charges. In the past, freight absorption has been used as an argument against increasing Detroit quotas.

While the steel distribution picture remains unchanged on the surface, steel buyers are busy here comparing costs of their products from each of the larger mills. In the final analysis these prices will undoubtedly be important factors in determining steel buying practices. Purchasing agents are quick to point out, however, that the first cost of the steel is only one factor that determines steel buying policies. The desirability of having at least three sources for many items, together with long and favorable experience with the products of certain mills are likewise important factors in placing steel orders, they say.

The flat prediction that Great Lakes would have all the price ad-

Buyers Are Busily Comparing Costs of Products From Different Mills

By WALTER G. PATTON
Detroit Regional Editor

Advantages in Detroit hasn't materialized—yet. For example, a comparison made by a large local steel buyer of delivered prices of hot rolled sheet to Detroit shows that one supplier *shipping by truck* from Cleveland can lay down hot rolled sheets at the customer's door

Estimated water shipping costs place the delivered price here of hot rolled sheets at 3.45¢ per lb from Buffalo and Chicago compared with the Great Lakes price of 3.50¢ per lb.

A similar situation exists in the case of cold rolled sheets. In this case, a comparison of cost of sheet delivered by rail to the customer's door show an estimated price of 4.25¢ per lb for Great Lakes compared with 4.34¢ per lb for its nearest competitor. Pittsburgh sheets cost the steel user here 4.46¢ per lb if delivery is by rail; estimated rail delivery from Chicago costs 4.44¢ per lb. Approximate cost of cold rolled strip furnished by a Detroit re-roller is 4.55¢ per lb.

Where truck delivery can be made, two Cleveland mills are at present charging less than Great Lakes for cold rolled sheets, according to the comparison shown in Table 2. The estimated delivered price range is from 4.25 to 4.55¢ per lb. The truck price range is from 4.23 to 4.35¢ per lb.

As in the case of hot rolled, cold rolled sheets can be delivered here for the lowest cost available to the steel user. Informed sources estimate that the water route is available about 8 months of the year. It should be kept in mind, however, that the water rates quoted are an approximation—the exact figures cannot be computed. Similarly, the truck rates are subject to change, with some carriers either planning or about to make higher freight charges than those used in the tables.

Mill	Rail	Truck	Water
Great Lakes, Detroit.....	3.50	3.50	.....
Republic, Cleveland, O.....	3.59	3.48	.....
J & L, Cleveland, O.....	3.64	3.53	.....
Youngstown, Young'twn, O.....	3.64	3.54	.....
Bethlehem, Buffalo, N. Y....	3.65	3.60	3.45
McLouth, Detroit	3.65	3.65	.....
Inland, Chicago	3.69	3.54	3.45
Carnegie-III., Pittsburgh.....	3.71	3.60	.....
Weirton, Weirton, W. Va.	3.71	3.60	.....
Wheeling Steel, Wheeling, W. Va.....	3.71	3.60	.....
Armco, Ashland	3.72	3.61	.....
J & L, Pittsburgh.....	3.76	3.65	.....

in Detroit at 3.48¢ per lb compared with the estimated Great Lakes delivered price of 3.50¢ per lb. Another Cleveland supplier shipping by truck is delivering hot rolled steel here at 3.53¢ per lb.

Where the shipment is by rail, Great Lakes has an estimated advantage at present of .09¢ per lb over its nearest competitor.

These comparisons are based on an estimated delivery charge of .05¢ per lb from Great Lakes to the customer's dock. This is shown in Table 1.

At the present time the spread of delivered Detroit prices of mills as far east as Buffalo and as far west as Chicago for hot rolled sheets is 26¢ per lb. Comparisons of costs to the buyer where shipments are made by truck reduce this spread to 15¢ per lb.

TABLE 2
Estimated Costs of Cold Rolled Sheets
Delivered to a Detroit User
(Cents per lb)

Mill	Rail	Truck	Water
Great Lakes, Detroit.....	4.25	4.25	.....
J & L, Cleveland, O.....	4.34	4.23	.....
Republic, Cleveland, O.....	4.34	4.23	.....
Armco, Ashland	4.39	4.28	.....
Youngstown, Young'twn, O.....	4.39	4.29	.....
Bethlehem, Buffalo, N. Y....	4.40	4.35	4.20†
Inland, Chicago, Ill.....	4.44	4.29	4.20†
J & L, Pittsburgh.....	4.46	4.35	.....
Weirton, Weirton, W. Va.	4.46	4.35	.....
Carnegie-III., Pittsburgh	4.46	4.35	.....
Wheeling Steel, Wheeling, W. Va.	4.46	4.35	.....
Craine-Schrage, Detroit.....	4.55*	.....	.....

* Cold Rolled strip † Approximate

Industrial Briefs . . .

- **NEW FIRM**—Vesuvius Crucible Co., Swissvale, Pittsburgh, has announced that they are now represented in the St. Louis district by Interstate Sales Inc., 817-819 Arcade Bldg., Eighth & Olive Sts. Frank G. Weyforth, formerly division sales manager, Laclede-Christy Clay Products Co., and James F. Gilbert, formerly president of the Gilbert Brass Foundry Co., are the organizers of the new firm.
- **BRANCH OFFICE**—The Wheelco Instrument Co. has opened a new office at 138 E. Becher St., Milwaukee. M. A. Embertson will be in charge of the new Wisconsin office.
- **GRANTS LICENSE**—Fairchild Engine & Airplane Corp. has concluded a licensing agreement with Wellworthy Piston Rings, Ltd., of Lymington, Hampshire, England, covering use of Fairchild's Al-Fin process for bonding aluminum to iron, steel and other metals.
- **ACQUISITION**—The Electric Auto-Lite Co., Toledo, has announced the signing of a contract for the purchase from the WAA of the former Wright Aeronautical plant at Lockland, Ohio, which occupies an area of about 200 acres and will acquire title to about 4.5 million sq ft of floor space.
- **ARMCO EXPANDS**—Armco Steel Corp. has contracted to purchase the assets of the Jackson Tube Co., Inc., Piqua, Ohio, manufacturers of mechanical tubing. The Jackson company will be operated as the Tubing Div. of Armco Steel Corp. effective Sept. 1. Samuel E. Jackson, its president and founder, will become the manager of the new Armco division.
- **WESTERN OUTLET**—The American Brass & Copper Sales Co., 1920 Union St., Oakland, Calif., has been named distributor for special aluminum mill products manufactured by the Reynolds Metals Co., Louisville.
- **SALE APPROVED**—WAA has approved sale of the government owned wartime shell forging plant near Fontana, Calif., subject to national security provisions, to Taylor Forge & Pipe Co., Chicago. The property which cost the government \$5.5 million was sold for \$850,000. The purchaser will operate it for production of pipe, fittings and forgings.
- **BUILDING FURNACE**—An 85-ton per hour billet heating furnace which will replace a 40-ton furnace in use since 1929 will be designed and built for the Timken Roller Bearing Co., Canton, Ohio, by Rust Furnace Co., Pittsburgh. Effective length of the new furnace will be 85 ft and the inside width will be 20 ft. Construction will begin late in 1948.
- **FOREIGN PERMIT**—The Glidden Co., Scranton, Pa., has recently licensed the Euston Lead Co., Ltd., of Australia to use the Euston process for the manufacture of white lead. The Australian company has constructed a plant at Melbourne and will be in production by December or January.
- **NEW MANAGEMENT**—Announcement has been made that Arthur J. Seiler, vice-president of the Phosphor Bronze Corp., Philadelphia, and Joseph M. Baxter, secretary and treasurer of the Phosphor Bronze Smelting Co., have acquired all of the stock of the Main Belting Co., Philadelphia. No changes are planned in the operations of the company and it will continue to deal exclusively in all types of conveyor and transmission belting.
- **REPRESENTATIVE**—George E. Quigley, Inc., Detroit, has been appointed by Metals Disintegrating Co., Inc., Elizabeth, N. J., as their representative in the State of Michigan to handle the sale of their complete line of aluminum and bronze powders and pastes.

Wire Company Sets Up New Division For The Electrical Wire Sales

Cleveland

• • • A new separate sales division with four regional offices has been set up to handle the electrical wire and cable products of American Steel & Wire Co., according to an announcement by H. M. Francis, vice-president in charge of sales of the wire company.

Establishment of the new division will permit concentration of sales effort on such items as paper insulated cable, rubber jacketed cable, galvanized telephony wire, and Amerductor, a transmission cable used for rural electrification lines, Mr. Francis said in making the announcement.

T. F. Peterson, who has headed the section of the general sales staff of the company devoted to electrical products, will serve as manager of sales of the new division. Offices will be in the Union Commerce Bldg., here.

Mr. Peterson started with American Steel & Wire Co. as a mechanical engineer in the New York sales office, and in 1936 became director of the Electrical Cable Works at Worcester. In 1941, he came to Cleveland as director of electrical cable engineering and research. He holds numerous patents in the electrical field.

C. H. Eisenhardt, formerly assistant manager of sales in the section, will serve as assistant manager of sales. Four district sales offices under the new organization will be established in Boston, Cleveland, Chicago and New York.

Appointees to the positions of managers in these various offices are as follows: C. H. Currier, manager New England district, electrical products sales; V. W. Heiberger, Central district; R. Coates, Western district; C. Vaill, Eastern district.

Mr. Francis also announced appointment of three district electrical sales engineers to serve in the new division. They are: Curtis Plass, Western district, Chicago; Walton P. Lewis, Central district with headquarters in Pittsburgh; and Harry E. Purdy, Eastern district, New York.

Small Business Committee Investigators Invade Steel Company

Pittsburgh

• • • Armed with subpoena power, the Senate Small Business Committee is undertaking a survey of the sales and distribution pattern of major steel mills. The committee has already prepared a questionnaire for distribution to the mills. The mills will be asked to reveal quantities of steel sold to all types of customers. They will also be asked to reveal the geographical locations of customers, but not their names.

The questionnaire is designed to show three things: (1) It aims to show whether fabricators located near the mills are getting more steel than those located at distant points. (2) It hopes to determine whether the mills of the integrated companies are selling a disproportionate amount of their semifinished products to their own finishing facilities at the expense of independent fabricators. (3) It seeks to learn to what end use fabricators put the steel which they receive from the mills.

A preliminary testing of the questionnaire was under way last week in Pittsburgh. The test is being conducted by three investigators of the committee. Guinea pig for the experiment is the Carnegie-Illinois subsidiary of U. S. Steel Corp., permission for the test having been obtained from David Austin, vice-president. Results of this preliminary test are expected to determine whether or not the questionnaire will require revision before being applied to all the major steel mills of the nation.

Steelmakers can not be expected to relish this type of inquisition. Like other business men they are adamant in their belief that they should be left free to conduct their business as they see fit—so long as they are not breaking the laws of the land. On the other hand, however, they have little to fear from this questionnaire.

If the committee expects to reveal sweeping changes in the distribution of steel since the advent of the change to f.o.b. selling, it will be disappointed. While some changes have occurred, and will continue to occur, the sweeping changes predicted by some are not yet fact.

Pretesting of Questionnaire Takes Place at Carnegie-Illinois Steel Offices

By BILL PACKARD
Ass't. News, Markets Editor

The reason of course is the continued strong demand for steel and steel products.

Consumers far distant from their present source of supply do not want to lose the advantage of historic relationship with their supplying mill. At least not without assurance from a closer mill that it will supply them at least as much steel as they have been getting. And the mills, hard pressed to fill present customer quotas, are in no

position to take on new customers—even if they are closer.

Long before the steel industry capitulated to mounting FTC pressure against the basing point method of selling some producers had been steadily, if slowly, withdrawing from distant markets. They were doing this for the very practical purpose of saving freight absorption. Unquestionably this trend will continue. But the situation is now reversed. It is now the steel consumer, seeking a closer mill source to reduce freight costs, who is causing the change. And he can affect a change only when he can obtain assurance of supply from a closer mill, which may not be able to accept his order in the face of quota commitments which already equal its capacity.

Of course, any weakening in demand for steel would immediately serve to accelerate this change in the pattern of steel distribution. But even the perennial prophets of failing steel demand are speaking much more softly than they did a year ago. Some slight soft spots might be beginning to make their appearance in the market. For example, it could be pointed out that orders for stainless and alloy grades of steel declined slightly in the past month; while this is true, it is still too early to tell whether this is just a temporary dip, or whether supply is actually catching up in its race with demand. At any rate these products still cannot be obtained on a moment's notice.

Meanwhile, some companies report orders for other types of products continue to increase. Backlog orders for oil and gas line pipe now extend through 1953, National Tube Co. said last week. Demand for sheets, too, appears to be unabated.

What the Senate Small Business Committee hopes, primarily, is to find out what the steel industry can do to channel more steel into the hands of small manufacturers. The industry is sympathetic with this aim, but has found the fact more difficult than the theory.

Instead of increasing mill quo-

(CONTINUED ON PAGE 124)

Pretest Probe

Washington

• • • The Senate Small Business Committee, sponsor of the investigation, selected U. S. Steel and Bethlehem as being typical producing firms for the probers' pretest visit to Pittsburgh.

Senator Martin, R., Pa., chairman of the steel subcommittee, admits that inequities in steel distribution are "difficult of solution."

But it should not be an insurmountable problem, he adds, "if the steel industry is earnest in its desire to keep the normal channels of trade open to free, competitive enterprise."

The overall investigation, according to Senator Martin, will include "a complete record of sales of steel products by steel companies to their integrated operations, and a comparison of such sales with those to independent companies, at all levels of operation, together with a finding as to the effects upon independent users and producers resulting from such integrated operation."

Sales records on hot and cold-rolled sheet, bar and strip will provide the framework of the survey. The information acquired by the committee will be turned over to the Federal Trade Commission for further analysis. This was first proposed in an earlier committee report on distribution practices (THE IRON AGE, Jan. 15, 1948, p. 98).

Canadian Steel Production and Shipments

Toronto

• • • Canadian production of primary iron and steel shapes for the month of May totaled 318,416 net tons, as compared with 318,594 tons in April and with 282,416 tons in May, 1947. Output for May included 303,298 tons of carbon steel shapes and 15,118 tons of alloy steel shapes. In the production figures for May are included 85,676 tons of shapes shipped to producers own plants or plants within the primary industry for further processing.

Shipments for sale of primary iron and steel shapes in May amounted to 229,672 net tons of which 215,728 tons were carbon steel shapes and 13,944 tons alloy steel shapes; in April shipments totaled 220,508 tons and included 206,875 tons of carbon and 13,633 tons of alloy steel shapes, and for May, 1947, shipments amounted to 202,681 tons including 191,562 tons of carbon and 11,119 tons of alloy steel shapes. The above figures which show iron and steel shapes for sale do not include deliveries for further processing.

The following table shows production and shipments for sale of primary iron and steel shapes for the month of May in net tons:

May 1948	CARBON STEEL		ALLOY STEEL	
	Made	Shipped	Made	Shipped
Billets, etc., for forging.....	8,110	5,834	4,359	4,210
Other semi-finished shapes, not for rerolling by makers.....	41,134	3,280	209	.....
Structural shapes and piling.....	10,298	12,643	.....	.....
Plates.....	22,890	22,132	342	268
Rails.....	32,726	32,412	.....	.....
Tie plates and track material:				
Splice bars.....	2,387	2,956	.....	.....
Tie plates.....	6,304	6,311	.....	.....
Spikes.....	1,098	1,124	.....	.....
Concrete reinforcing bars.....	6,344	6,453	.....	.....
Hot rolled bars for cold finishing.....	938	.....	.....	.....
Other hot rolled bars.....	53,802	40,834	7,852	7,283
Pipes and tubes.....	10,135	11,343	.....	.....
Wire rods.....	24,065	13,876	27	3
Hot rolled black sheets.....	21,948	15,025	.....	.....
Cold reduced black sheets.....	4,162	3,910	.....	.....
Galvanized sheets.....	8,242	8,237	.....	.....
Steel castings.....	8,265	7,374	1,611	1,492
Miscellaneous hot rolled products.....	23,073	4,403	398	380
All other products.....	17,377	17,581	320	308
TOTAL.....	303,298	215,728	15,118	13,944

Producers' shipments of primary iron and steel shapes subdivided according to principal consuming industries for the month of May in net tons, follow:

Industry	CARBON STEEL	ALLOY STEEL
Automotive industry.....	7,351	5,204
Agricultural, including farm machinery.....	9,155	301
Building construction.....	25,663	69
Containers industry.....	17,026	.....
Machinery and tools.....	11,141	745
Merchant trade products.....	19,891	135
Mining, lumbering, etc.....	6,215	600
National defense.....	32	2
Pressing, forming and stamping.....	11,158	86
Public works and utilities.....	976	93
Railway operating.....	32,173	295
Railway cars and locomotives.....	19,308	427
Shipbuilding.....	5,210	41
Miscellaneous and unclassified.....	611	156
Wholesalers and warehouses.....	24,827	192
Direct export (a) to British Empire.....	16,415	2,637
(b) to Other Countries.....	8,576	2,961
Total shipped for sale.....	215,728	13,944
Producers' interchange.....	85,676	209

Steel Probe

(CONTINUED FROM PAGE 123)

tas, most companies are expected to cut fourth quarter quotas for their consumers by 3½ to 5 per cent. This is largely due to the fact that twice as much steel is now moving on government orders as was moving last spring. One thing is certain—no steel company will permit an order of a fabricator holding a defense contract to go unfilled, if it can help it. Not while the specter of government control in the form of compulsory allocation remains to be invoked at the discretion of the President.

The committee avowedly will attempt to determine whether the steel industry has supplied steel to its own finishing facilities at the expense of independent fabricators. The steel industry has long felt that the Senate Small Business Committee has been asking the impossible of them. They naturally do not want their own finishing facilities to remain idle while semi-finished steel is channeled to other consumers. Some of them feel, too, that the complaints of independent fabricators that they are not getting enough steel have been encouraged by the committee. "For that matter," they ask, "who is getting all the steel they want?" And they are not overlooking the fact that this is an election year.

Certainly, as long as government pressure for more steel for "must" programs continues unabated, and consumers continue to approach mills with arguments for more steel, demand will remain tight. And that's putting it mildly.

Revere Earnings Decline

New York

• • • Revere Copper and Brass Inc., showed a net income of \$274,926.37 for the first 6 months of 1948.

After preferred stock dividends of \$2.36 per share was declared each of the 1,286,916 common shares outstanding.

This compares with a net income of \$4,757,947.86 or \$3.50 a share for the corresponding period last year.

WAA Blast Furnace at Cleveland is Hub of Bitter Arguments

Cleveland

• • Last week Cleveland became the center of a warplant disposal fight with implications that are of nationwide importance. The controversy, stirred up by a simple War Assets Administration announcement on Aug. 17 that Kaiser-Frazer Corp. would begin operating Sept. 1 the 1200-ton a day blast furnace and 1100-ton a day coke oven battery built by the government at a total cost of \$28 million and operated during and after the war by Republic Steel Corp., threatens to continue for a long time. A decision is sure to require a study of the problem by highest administration officials because of its implications to the rearmament and European recovery programs.

A close study of all the available facts indicates probability that the controversy originated out of a shrewd game of bluff and counterbluff on the part of two of the three directly involved parties. The joker in the deal is the provision in the interim lease for cancellation by either party after 30 days' notice. Should WAA exercise its right of cancellation, there is a provision to reimburse Kaiser-Frazer for WAA-approved expenditures for improvements, alterations or repairs to plants. The declared purpose of the interim lease is to work out the details of a sales agreement or long term lease.

According to the informed opinion of industry observers, it is totally unlikely that the administration would permit this plant to be removed from its important function of supplying foundry pig iron for use in the housing or other essential programs. Neither is it probable, according to this information, that Republic Steel Corp. would permit any action to be taken which would jeopardize its acquisition of these plant facilities that had been offered to Republic well below the current cost of replacement.

The terms of the interim Kaiser-Frazer lease call for the payment to WAA of \$1.50 per ton of pig iron and coke produced, plus the assumption of the cost of operation, maintenance, taxes and insurance. A base purchase price of

Republic Steel Feels They Got Short End of Stick in Latest WAA Move

By JOHN ANTHONY
Eastern Regional Editor

\$14.2 million is proposed in the agreement subject to adjustment to reflect any loss of productivity sustained by Kaiser-Frazer from possible lack of cooperation or obstruction by Republic Steel. The long term lease proposal calls for the payment of \$2 a ton for pig iron and \$1.50 a ton for coke for a 20-year period based on a \$43 pig iron market, with an adjustment of 5¢ a ton on pig iron and 3½¢ on coke for every \$1 a ton change in the pig iron market. A minimum yearly rental of \$800,000 is proposed. Minimum payments per ton of production regardless of market price are proposed at \$1.50 for pig iron and \$1.25 for coke.

The first move was taken by Republic Steel Corp. in an effort to bring to a head negotiations extending over an 11-month period since the expiration of the Republic operating lease on Sept. 1, 1947. Various proposals for Republic acquisition of the scrambled plant facilities were made by WAA and Republic during the period without

any approaching agreement in prospect. According to Jess Larson, War Assets Administrator, proposals advanced by him during this period included an interim lease, a long term lease with purchase option, outright purchase and, because of the paramount public interest existing at present, operation on a basis of cost plus fixed fee. Mr. Larson also said that Republic had declined an offer to arbitrate the questions in dispute.

Meanwhile, the plant was being operated during this period without any existing agreement. Fearful of incurring unreasonable rental charges which would have to be established retroactively, Republic advised the administrator on Aug. 10 that production at the government facilities would be discontinued on Aug. 31, unless WAA agreed that operations continue after that date on an interim basis, on the rental conditions set forth in Republic's proposal of Dec. 11, 1947. At once Administrator Larson offered the above proposal to Kaiser-Frazer, which was quickly accepted. According to a statement made to THE IRON AGE Washington Bureau by a spokesman for WAA, Republic had submitted only a single proposal during the 11-month period, in essence an offer to buy the coke ovens for about \$4.2 million and to lease the furnace with a purchase option at \$7.7 million.

It is clear from the surprise which Republic Steel officials received the information on the Kaiser-Frazer lease that there had been

THIS IS IT: Here is the blast furnace about which the arguments fly thick and fast at Cleveland. Kaiser-Frazer has leased it from WAA but more will be heard about furnace and coke plants in months to come.



no real belief that these facilities would be diverted so quickly to another producer. At the same time, it is known that certain foundry customers in some areas had already been cautioned 2 weeks ago to attempt to find another source of supply for iron. Republic officials disclaim any knowledge of this action at that time. It is clear that the information must have been acquired through trade channels.

Immediately after the announcement, however, all Republic pig iron customers were notified officially by the company that they would no longer be in position to furnish merchant iron. At once a swarm of complaints descended on the heads of the Dept. of Commerce officials responsible for the voluntary pig iron allocations program. In Buffalo, the Chamber of Commerce has organized to take immediate action.

According to a statement by Republic's president, Charles M. White, foundry consumers buying Republic pig iron will be major losers in the transaction.

Kaiser-Frazer Corp., caught by surprise by the offer of the facilities, has had no opportunity as yet to work out any additional sources of supply for ore and coal needed to put the plant into production. A Kaiser spokesman said that the company would now be able to ship

the entire output of its Iron-ton, Utah, furnace to Fontana to relieve pressure on its West Coast plant. Hitherto, it has been necessary to ship half of the Utah production east for use at Willow Run.

On Aug. 19, Edgar Kaiser and his advisers were closeted with Republic officials attempting to work out ways and means for an independent operation of the scrambled facilities. Prior to this time Republic had already signified its intention to remove all iron ore and other raw materials from the property for use in other plants.

The offer made by Republic some time ago is, from their viewpoint, the highest possible offer warranted by the sale of pig iron at legitimate market prices. According to a Republic statement, "The lease which we have proposed is based on a value substantially equivalent to the price which Inland Steel Co. paid for not one, but two blast furnaces and two batteries of coke ovens, greatly in excess of the price paid by Pittsburgh Steel Co. for a blast furnace located adjacent to their plant, greatly in excess of the price paid by the Lone Star Steel Co. for the RFC blast furnace coke ovens and ore mine in Daingerfield, Tex., and greatly in excess, on a unit basis, of the price paid by the Geneva Steel Co. for the Geneva, Utah, blast furnace and steel plant.

"The administrator and staff of WAA have been fully cognizant of the fact that the output of the Cleveland RFC furnace has been used in our steelworks and this has made it possible for us to divert a substantial tonnage of iron from other furnaces in this section of the country from our steelworks to supply our hundreds of pig iron customers. The loss of this furnace will force us to discontinue completely the production of pig iron in the North to the dries and merchant pig iron and, in addition curtail our making operations. We have exhausted every means at our command to prevent the inevitable shutdown on many of the plants who have depended upon us for iron. The fate of these plants is now in the hands of the government."

Reports Decreases In Net Income For Year

Athol, Mass.

• • • Remarks by Arthur H. Starrett, president, in the report of L. S. Starrett Co., Athol, Mass., precision tools, for the fiscal year ended June 30, indicate clearly that management has been hard pressed to keep earnings from straying far from more prosperous years.

He says in part: "Turbulent economic conditions and rising costs make predictions difficult, but the company looks to the future with confidence. Efforts are continuing to be made to cut costs, but when this is impossible, the only alternative is to increase prices or discontinue the production of certain lines."

Net income for the year ended June 30, 1948, was \$1,069,200 on sales of \$8,343,000 with earnings per share \$7.29. For the preceding year was \$1,242, sales \$8,161,913, and earnings per share \$7.78.

Chile Gets Tin Mill

New York

• • • A complete tin mill, believed to be the first of its kind shipped to South America, has been reported having loaded piece by piece into the American Grace cargo liner Santa Rita for shipment at Valparaiso. The mill formerly operated at Sault Marie, Ont., was sold some time ago to Chilean tin interests.

Coming Events

- Aug. 30-Sept. 3 American Chemical Society, national meeting, Washington.
- Sept. 6-10 American Chemical Society, national meeting, St. Louis.
- Sept. 13-17 American Chemical Society, national meeting, Portland, Ore.
- Sept. 13-17 Instrument Society of America, conference and exhibit, Philadelphia.
- Sept. 28-Oct. 1 Assn. of Iron & Steel Engineers, Convention and Iron and Steel Exposition, Cleveland.
- Oct. 4-7 American Institute of Steel Construction, annual convention, Quebec, Canada.
- Oct. 5-7 Industrial Packaging Engineers Assn., Industrial Packaging and Materials Handling Exposition, Chicago.
- Oct. 5-9 Concrete Reinforcing Steel Institute, semiannual meeting, Asheville, N. C.
- Oct. 11-13 National Lubricating Grease Institute, annual convention, Chicago.
- Oct. 11-13 American Society Tool Engineers, semiannual meeting, Los Angeles.
- Oct. 13-15 Porcelain Enamel Institute, annual forum, Urbana, Ill.
- Oct. 18-22 National Safety Congress and Exposition, Chicago.
- Oct. 22-25 Metal Treating Institute, annual meeting, Philadelphia.
- Oct. 23-29 American Society for Metals, annual convention, Philadelphia.
- Oct. 24-29 American Welding Society, annual meeting, Philadelphia.
- Oct. 25-27 American Institute of Mining and Metallurgical Engineers, Metals Div., fall meeting, Philadelphia.
- Oct. 25-27 American Gear Manufacturers Assn., fall meeting, Chicago.
- Oct. 25-29 National Metal Exposition, Philadelphia.
- Oct. 27-28 Society for Nondestructive Testing, annual convention, Philadelphia.

Scotland's Power Program Is Biggest In European Post-War Reconstruction

o o o



ABOVE: The largest overland conveyor belt in Britain is used to lay the foundations for the Loch Sloy dam. In the background the conveyor is seen rising to a height that the crushed stone can be conveniently tipped into large concrete mixers. The sluice channel on the right carries river water while the work proceeds across the normal river bed.



ABOVE: Workers are positioning the end of a sheer leg for one of the large cranes used to pour concrete. Approximately 108 projects are planned or in the process of being planned which will eventually generate enough electricity for Scotland. The total cost will exceed \$400 million.

o o o

RIGHT: The dammed up waters from the Falls of Tummel will flow through this tunnel when completed. Cornish workmen drill and blast 9 ft into the rock every 21 hours. The tunnel will be horseshoe shaped, over 2 miles long and lined with concrete so as to be the equivalent of a 22.5 ft diam pipe.



Canadian Pig Iron Production Is Near May All-Time Peak

Toronto

• • • Canadian pig iron production in June amounted to 183,763 net tons or an average daily rate of 81.4 pct of rated capacity. This is to be compared with the all time peak of 193,305 tons made in May when the daily average was 82.9 pct, and with 159,826 tons in June, 1947, when the daily average was 70.8 pct.

For the month under review, pig iron output included 148,641 tons of basic iron of which 139,337 tons were for further use by producers and 9304 tons for sale; 18,809 tons of foundry iron with 840 tons for further use and 17,969 tons for sale; and 16,313 tons of malleable iron, all for sale.

For the first 6 months this year cumulative pig iron production totaled 1,031,693 net tons, compared with 973,153 tons for the corresponding period of 1947 and 876,023 tons for 1946.

Production of ferroalloys in June amounted to 13,502 net tons against 18,436 tons in May and 16,212 tons in June, 1947. For the month under review output included by tonnage, ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chorm-x and ferrophosphorus. In the first 6 months this year, output of ferroalloys totaled 89,653 net tons against 77,750 tons in the 1947 period and 68,991 tons in 1946.

Following are comparative monthly production figures for 1948 in net tons:

	PIG IRON	FERRO-ALLOYS
January	160,042	17,127
February	151,123	11,823
March	172,675	14,293
April	170,785	14,474
May	193,305	18,436
June	183,763	13,502
Total, 6 Months.....	1,031,693	89,653

Alan Wood Earnings Climb

Philadelphia

• • • The report of Alan Wood Steel Co. for the 6 months ended June 30, 1948, shows net income, after all charges and taxes, of \$1,274,356, compared with \$994,025 in the first 6 months of 1947. Net sales amounted to \$21,696,251 for the first 6 months of 1948 compared with \$17,896,850 in the same period of 1947.

Construction Steel

• • • Fabricated steel awards this week included the following:

4425 Tons, Indianapolis, Western Electric building, to R. C. Mahon Co., Detroit.
2200 Tons, Port Washington, Wis., power house extension, Wisconsin Electric Power Co., to Worden-Allen Co., Milwaukee.

195 Tons, Prairie and Dawson Cos., Mont., bridges on Terry-Glendive Rd., through Northwestern Engineering Co. to Bethlehem Steel Co., Inc., Bethlehem.

• • • Fabricated steel inquiries this week included the following:

500 Tons, Detroit, power house addition, Detroit Edison Power Co.

• • • Reinforcing bar awards this week included the following:

2500 Tons, Chicago, apartment buildings for the Chicago Housing Authority; contract awarded to S. N. Nielsen Co., Chicago.
810 Tons, Chicago, Allstate Insurance Co. building; contract awarded to B-W Construction Co., Chicago.

305 Tons, East Boston, Mass., extension rapid transit tunnel, through V. Barletta and Co., Roslindale, Mass., to Bethlehem Steel Co., Bethlehem.

• • • Reinforcing bar inquiries this week included the following:

3090 Tons, Los Angeles, improvement of Tujunga Wash, Los Angeles River, Corps of Engineers, Los Angeles, Serial No. Eng-04-353-49-7, bids to Sept. 14.

425 Tons, Shelton and Darby, Conn. Housa-

tonic River Bridge substructure. M. Construction Co., New Haven. bidder.

360 Tons, Hinsdale, Ill., Township se-

• • • Castings and miscellaneous steel and iron inquiries this week included the following:

320 Tons, East Boston, Mass., airplane apron and facilities, General Airport.

• • • Piling awards this week included the following:

150 Tons, Prairie and Dawson Cos., bridges on Terry-Glendive Rd., Northwestern Engineering Co. to negie-Illinois Steel Corp., Pittsb-

• • • Piling inquiries this week included the following:

1130 Tons, Shelton and Darby, Conn. tonic River Bridge substructure. M. Construction Co., New Haven. bidder.

• • • Railroad car awards this week included the following:

To General American Transportation Co., 750 50-ton hopper cars for Central; 100 70-ton covered hoppers for Detroit, Toledo & Shore Line; 200 covered hoppers for the Atchison, To Santa Fe R.R. Co. To Pressed Steel Co. Inc., Pittsburgh, 600 50-ton hoppers Pittsburgh-Western Virginia Railroad 1000 55-ton hoppers for the Virginia road.

50 YEARS AGO

THE IRON AGE, August 28, 1898

• "The question of electric vehicles is, to the general public, probably the most interesting among recent applications of electricity and the field it opens up for storage batteries is almost beyond limitation. There certainly cannot be the same sympathy and affection between the owner and the electric motor as there is between him and the horse, but for commercial uses there are many reasons why the electric vehicle should supersede our present methods."

• "News comes from London to the effect that the famous British scientist, Professor Ramsay who was one of those responsible for the discovery of argon gas, has now eliminated from the atmosphere a new gas to which he has given the name of Crypton."

• "The old prejudice against the alternate current motor has become nothing more than his-

tory. As the original promoters of the use of ac apparatus, the Westinghouse Co. have been outstanding in the development of equipment of this type, whether in monophase or polyphase systems."

• "Jones & Laughlin Ltd. have just issued the 13th edition of their famous manual of Useful Information for Business Men, Mechanics and Engineers. This diminutive book, easily carried in the vest pocket, has long been in high favor among engineers."

• "A newly announced substitute for rubber, named Perchoid by its inventor, Dr. Napier Ford, is described as an oil which has undergone a high degree of oxidation. It is heated with litharge and mixed with sulfur. The promoters have the impression that it will be largely used in the pneumatic tire industry."

Weekly Gallup Polls . . .

Farmers' Political Sentiment Points To GOP and Dewey

etron, N. J.

• American farm voters, who have been moving away from the Democratic party and into the Republican camp since 1936, are today in favor of Gov. Thomas E. Dewey for President by a substantial margin, according to George Gallup, director, American Institute of Public Opinion.

Recent indications are that Gov. Dewey will poll a higher proportion of the farm vote this year than he did when he ran for President in 1940. However, a substantial proportion of farmers—12 pct—have yet made up their minds what party they favor.

Henry A. Wallace, himself a farmer and once Secretary of Agriculture, appears to have a limited appeal to the farm vote, with only 2 pct supporting him at present. Wallace third party strength is confined mainly to the nation's cities.

These are the highlights of farm political opinion in the institute's nationwide presidential poll conducted immediately after the Republican and Democratic nominating conventions.

Farmers in all states were asked:

"If a presidential election were held TODAY, how would you vote—for Dewey, for Truman or Wallace?"

FARMERS

	Pct.
Dewey	48
Truman	38
Wallace	2
No opinion	12

With the no opinion percentage eliminated, the division of the vote is:

	Pct.
Dewey	55
Truman	43
Wallace	2

The farm vote outside the South is traditionally Republican in the years before the New Deal. Then during the depression of the 1930s, millions of farm converts were won to the Democratic party. In the

election of 1936 approximately six out of every ten American farmers voted for Roosevelt. The trend away from the Democratic party was first seen in the 1940 election, as the following table shows:

	Democratic Pct.	Republican Pct.
1936 election	59	41
1940 election	54	46
1944 election	48	52
*Today's Poll	43	55

* Not shown in this table is the farm vote for Wallace—2 pct.

• • • Although the Republican party is stronger today than at any time in 16 years, it still has not succeeded in breaking Democratic hold on two large and important voting elements—manual workers and members of labor unions.

The working man's vote is not as solidly Democratic as in the days of the late Mr. Roosevelt. Henry A. Wallace's third party has cut into it considerably. Nevertheless the vote of this section of the population still leans toward the Democrats and will be of great aid to President Truman in November. The CIO is reported ready to take active part in support of the Democratic party, as in previous years.

From coast to coast voters were asked:

"If the presidential election were being held TODAY, how would you vote—for Truman, for Dewey or for Wallace?"

Those whose occupations fall in the manual worker group vote as follows:

MANUAL WORKERS

	Pct.
Truman	45
Dewey	38
Wallace	6
No opinion	11

With the undecided or no opinion eliminated the result is 50 pct for Dewey and 7 pct for Wallace.

All persons in the poll sample who indicated that they are members of labor unions voted as fol-

Manual Workers and Members Of Labor Organizations Favor Democratic Party and Truman

lows on the presidential preference question:

UNION MEMBERS

	Pct.
Truman	46
Dewey	38
Wallace	7
No opinion	9

With the no opinion eliminated the vote is 50 pct for Truman, 42 pct for Dewey and 8 pct for Wallace.

Reports issued during recent weeks by the institute show the pattern of political opinion this year shaping up as follows:

	Dewey Pct.	Truman Pct.	Wallace Pct.
Farmers	55	43	2
Manual Workers	43	50	7
Union members	42	50	8
ALL U. S.	53	41	6

The Democratic percentage among manual workers and union members is down considerably from other years, partly due to gains made by the Republicans and partly to the fact that Mr. Wallace splits the Democratic vote.

The trend in the last three presidential elections follows:

MANUAL WORKERS

	Dem. Pct.	Rep. Pct.
1936 election	74	26
1940 election	66	34
1944 election	62	38
*TODAY	50	43

* Wallace vote, not included in the table, totals 7 pct of those with opinions.

UNION MEMBERS

	Dem. Pct.	Rep. Pct.
1936	80	20
1940	72	28
1944	72	28
*TODAY	50	42

* Wallace vote 8 pct.

Machine Tool Builders Turn Slightly Sour on Future Outlook

• • • Optimistic views of a heavy year for machine tool builders are slowly growing dimmer as time passes without evidence of growing tool demand for rearmament or foreign reconstruction.

The infant prewar industry, having grown in capacity to a \$600 million a year adult, is not expected by some observers to exceed \$300 million billings this year, only slightly larger than last year in dollar volume. Sharply higher prices, which do not yet reflect the most recent increases in steel, castings and nonferrous metals, forecast lower unit shipments.

For months, builders and dealers have been holding to the belief that the rearmament programs and the buying here and offshore for foreign aid would be a bonanza. Now many members of the industry are coldly examining the facts to find what the future holds.

In tooling for rearmament, the only major field offering immediate promise is the jet engine program. Yet, not more than 2500 jet engines will be required at this time. Reciprocating engines are the backbone of the current aircraft program, but tooling is available in standby condition for production tremendously in excess of what would be required by the 70-group air force or any addition to it which would be made at this time, barring an actual declaration of war.

Aside from the aircraft building program, rearmament seems to hold little promise of important tool business this year. Observers point to the inactivity of the government ordnance plants which they know would be the first to show an armament program in being.

It is reliably reported in the industry that export sales volume has dropped to a low point of 10 pct from the normal average 15 pct to 25 pct of domestic sales. Basically, this is the result of the worldwide shortage of dollars. However, the industry had believed that with the implementing of the European Recovery Program, foreign orders would begin to flood in. This has

No Growing Tool Demand For Rearmament or Foreign Use in Sight Yet

• • •

not proved true. It doesn't mean that foreign manufacturers would not be glad to get American tools for their use. Information in the trade indicates that the foreign buyers covered by ECA stand ready to place orders at a volume that might well tax the capacity of domestic industry to produce.

Each nation a party to ECA is managing its ECA allotment to the greatest possible advantage. Priority is given to more essential requirements, which, of course, differ for each nation. So far no foreign government has deemed it advisable to build up metal fabricating industries in preference to what is considered more immediately essential. Food is the first essential in every country. Second is repair materials and equipment for damaged docks, bridges, railroads, and trucking and handling equipment. Only after these prime essentials are fulfilled does the country divert its attention to requirements for agricultural equipment and industrial plant equipment.

Timing is of critical importance. Acquisition of machine tools would require from 6 months to a year for delivery, coupled with requirements for increased steel, iron and nonferrous metal supplies, before foreign industry could begin the production of their most essential requirements.

How European nations feel about the essentiality of machine tools can be understood when one recalls the many German tool manufacturing plants available to victorious nations as reparations. Only Russia took the opportunity to rebuild its home industry. Other countries apparently felt that these facilities would place them at a competitive disadvantage with United States

industry using more modernment.

Strangely enough, now, with ports of United States tools but blocked off, some foreign machinery producers have been finding outlets in the U. S. This must be attributed to the urgent need to obtain the universally useful dollar.

Men in the industry are visualizing the impact of the coming depression on the will of Congress and the country to continue aiding Europe with loans. On the other hand, foreigners do not think in terms of the apocalyptic 15-month program at \$5 billion. Instead, some have actually proposed here about a 5-year period of aid to Europe, estimating the total contribution at \$25 billion.

Tool men are beginning to realize that before the U. S. can export to the extent required to maintain current industry it will be necessary to revise our national thinking on the tariff question, ECA or no. The world's largest creditor loans to foreign nations and they may place business with a country are no better than while protective tariffs on some of our products prohibit their export.

In facing this problem for some machine tool men realize a domestic free trade policy would result in some invasion of the American tool market by foreign producers. This sacrifice they believe necessary in order that the industry might reasonably to compete in the foreign market to a much greater extent than at present.

Workers Get 6¢ Increase

Springfield, Mass.

• • • Van Norman Co., Springfield, and workers have reached a new contract, thus ending a strike. Workers will get a 6¢ an hour boost now and 3¢ additional Jan. 17.

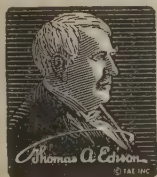
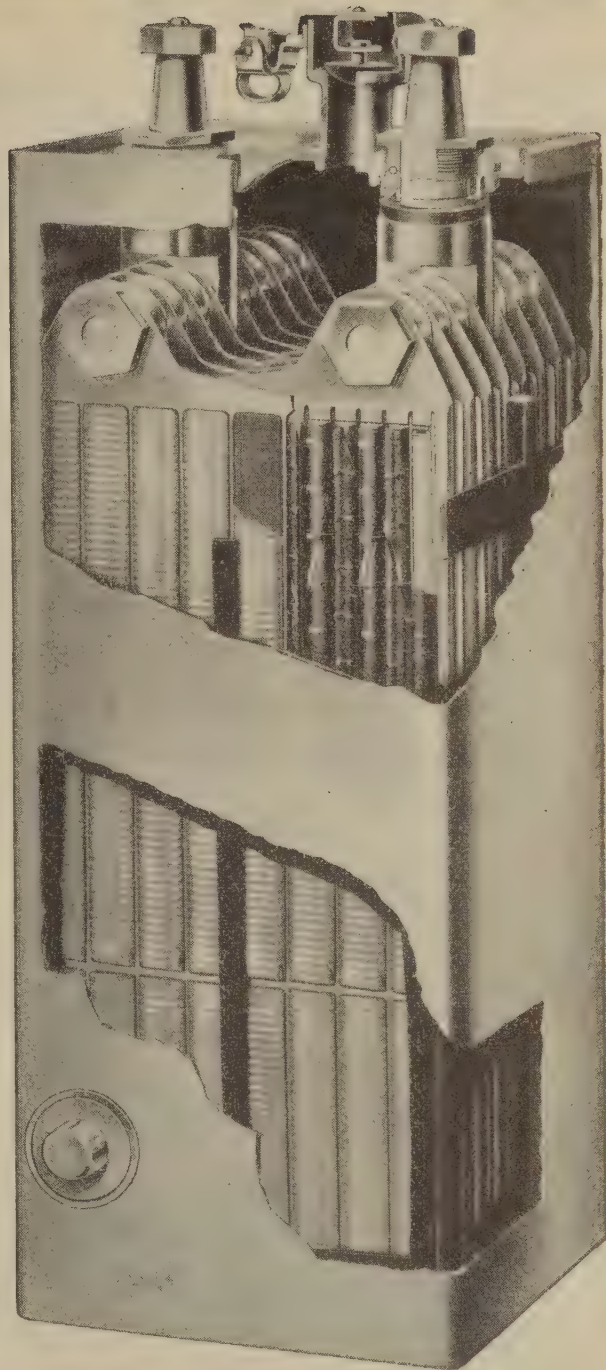
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Prices Stay Firm; Strong Undertone Prevails

New York

• • Formula prices seem to have only entrenched themselves at last despite rumors to the contrary last week. Prices across the board remained substantially the same. Demand continues heavy and a strong undertone prevails.

Only change in heavy melting grades was at Buffalo where No. 1 advanced \$1 to a top of \$48 because of strong demand and skimpy offerings.

The cast market continues to be erratic and spotty—but strong. Prices advanced \$1 a ton in Detroit for No. 1 cupola cast, heavy breakable cast, and automotive cast. In Cincinnati foundries are not exerting pressure on cast grades largely because of summer vacations.

Numerous price changes have been made for Cincinnati scrap because of a change in method of quoting prices there. We now quote *b. cars Cincinnati*, instead of *b. delivered consumer*. Price readjustments in most grades therefore reflect this change.

Considerable speculation exists in the Cleveland area as a result of Kaiser-Frazer taking over the blast furnace formerly operated by Republic Steel Co. If Kaiser can hold to the furnace, it is believed that Republic will have to start buying heavy melting for its Cleveland furnace in very large tonnages. Foundries that will be cut from all Republic iron as a result of this transaction will be hard pressed and undoubtedly will bid sharply for foundry grades in an effort to keep operating.

PITTSBURGH—The market here was steady, with movement reported good. The 50¢ advance in rail specialties registered a week ago held good. And this up was reported very firm at the other price. In fact, with the exception of two or three grades which reflected little movement or slight weakness, the price list was very firm. Major consumers were adhering strictly to the new formula. And they were reported buying very large tonnages. Despite scrap movement reported fair to very good, continued heavy consumption by the mills in this area was taking all the play.

Competition among consumers at existing prices remained very keen.

CHICAGO—With big mills holding to formula prices, openhearth scrap prices here appear to be anchored for the moment at \$41.50 to \$42 levels. If anything, the disposition of short interests to pay higher prices appear to be waning. However, the underlying tone of the market remains strong, and prices, particularly for cast grades, fluctuate over a wide range. Some sources indicate a spread as wide as \$15 per ton in cast iron. Anticipated sales of railroad lists this week will be closely watched for indications of market trends. In addition to actual scrap shortages, some users and dealers report considerable difficulties over grading requirements.

PHILADELPHIA—The market continues quiet with no price changes and little action expected until after Labor Day. Demand for heavy scrap is very strong with little of it available. Most of the scrap moving is of the light variety. Shipments remain much the same. One company is reported to be making considerable progress in building up a backlog of cast for the winter. Users of heavy melting grades, however, are experiencing little such success.

CLEVELAND—The market continues strong here but prices are fixed firmly to formula levels. Demand is steady, but despite the fact that the mills are not able to build up winter reserves, they are not attempting to exercise pressure to make purchases. Scrap of all grades is still in short supply in this market, but shipments are heavy at this time. Mills are looking toward the next few months to see a marked increase in intake. Speculation is rife as to the effect of the Republic-Kaiser furnace deal. Most factors feel that if Kaiser-Frazer is able to make the deal stick, there will be an important change in the heavy melting and foundry demand here and in adjacent markets. Republic, it is believed, will have to begin buying heavy melting for its Cleveland furnaces in very large tonnages. Foundries, cut off from all Republic pig iron, will start to bid up foundry grades very sharply. In the meantime, no factors are yet willing to gamble on the outcome. Some readjustment of foundry prices occurred last week. There were no changes in Valley prices.

DETROIT—With local mills reported to be comfortable with respect to scrap, the Detroit market is marking time although the undertone is strong. Reports of outstate sales of low phos at over-the-formula continue to come in. Some sources indicate that the tonnages involved are substantial. The cast market

is spotty—but strong—although Campbell, Wyant & Cannon, normally a large user, is out of the market. Most local foundries are more concerned at the moment with the loss of a major pig iron source than they are about events in the scrap market.

BUFFALO—No. 1 heavy melting steel advanced a solid \$1 last week to a top of \$48 on strong demand and skimpy offerings. And dealers were talking of a \$50 market for select scrap. Some brokers were reported paying over-formula prices to cover contracts for mill grades. Apparently in the belief that the formula is due for another jolt upward in the near future. The outside price for choice low phos scrap likewise was boosted \$1. Overall supplies of openhearth material were spotty, with allocated scrap constituting the bulk of the movement and carrying the full \$2.50 formula increase. Cast scrap was tight, but unchanged.

CINCINNATI—All factors here believe that scrap quotations in this market should be reported on the basis of f.o.b. cars Cincinnati, because all buying is done on that basis. Therefore, there are price readjustments in most grades to reflect this change. Mills are adhering to formula prices. Foundries are not exerting pressure on cast grades, largely because of low summer operations. There is considerable speculation on the effects of the Republic furnace deal as it would affect cast grades here. Developments are summarized in Cleveland market report.

NEW YORK—There were no price changes this week. The market remained static with demand still strong. Cast grades were particularly strong because of the New England pig iron shortage. But prices of cast grades did not advance as many sources had anticipated and are not expected to now. There is no improvement in the demand for chemical borings. As a result shipments are still very restricted.

BOSTON—The heavy demand and extreme shortage of scrap makes the new and higher formula prices a matter of theory rather than practice. The formula is \$34.40, the actual price is about \$36 for No. 1 heavy melting. Many are doubtful that the present formula can hold very long under the present conditions. All along the line prices appear firm to strong. No. 1 machinery cast is up around \$64 to \$65. Chemical borings are somewhat more in demand. As for heavy breakable, the mills show little desire for it. One mill is taking it at its own price, according to one broker.

BIRMINGHAM—A relatively heavy flow of openhearth material continues to move to consumers in this area and mills are able to build up improvements. Cast grades still are much in demand. Quality of scrap generally shows little improvement.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$42.50 to \$43.00
RR. hvy. melting.....	43.50 to 44.00
No. 2 hvy. melting.....	42.50 to 43.00
RR. scrap rails.....	57.00 to 58.00
Rails 2 ft and under.....	62.50 to 63.50
No. 1 comp'd bundles.....	42.50 to 43.00
Hand bld. new shts.....	42.50 to 43.00
Hvy. axle turn.....	44.00 to 44.50
Hvy. steel forge turn.....	44.00 to 44.50
Mach. shop turn.....	37.50 to 38.00
Shoveling turn.....	39.50 to 40.00
Mixed bor. and turn.....	37.50 to 38.00
Cast iron boring.....	39.50 to 40.00
No. 1 cupola cast.....	64.50 to 65.50
Hvy. breakable cast.....	55.00 to 56.00
Malleable.....	76.00 to 77.00
RR. knuck. and cup.....	53.50 to 59.50
RR. coil springs.....	53.50 to 59.50
RR. leaf springs.....	53.50 to 59.50
Rolled steel wheels.....	53.50 to 59.50
Low phos.....	49.50 to 50.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$41.50 to \$42.00
No. 2 hvy. melting.....	41.50 to 42.00
No. 1 bundles.....	41.50 to 42.00
No. 2 dealers' bundles.....	41.50 to 42.00
Bundled mach. shop turn.....	39.50 to 40.00
Galv. bundles.....	38.00 to 38.50
Mach. shop turn.....	36.50 to 37.50
Short shov. turn.....	38.50 to 39.50
Cast iron borings.....	38.00 to 40.00
Mix. borings and turn.....	36.50 to 37.50
Low phos. hvy. forge.....	51.00 to 52.00
Low phos. plates.....	49.00 to 50.00
No. 1 RR. hvy. melt.....	44.25 to 48.50
Rerolling rails.....	62.25 to 67.75
Miscellaneous rails.....	61.00 to 62.00
Angles & splice bars.....	59.00 to 60.00
Locomotive tires, cut.....	60.00 to 61.00
Cut bolster & side frames.....	54.00 to 55.00
Standard stl. car axles.....	72.00 to 73.00
No. 3 steel wheels.....	57.50 to 58.00
Couplers and knuckles.....	57.00 to 57.50
Rails, 2 ft and under.....	64.00 to 67.00
Malleable.....	32.00 to 33.00
No. 1 mach. cast.....	74.00 to 75.00
No. 1 agricul. cast.....	68.00 to 70.00
Heavy breakable cast.....	63.00 to 65.00
RR. grate bars.....	67.00 to 68.00
Cast iron brake shoes.....	60.00 to 61.00
Cast iron car wheels.....	63.00 to 64.00

CINCINNATI

Per gross ton, f.o.b. cars.

No. 1 hvy. melting.....	\$40.00 to \$41.00
No. 2 hvy. melting.....	40.00 to 41.00
No. 1 bundles.....	40.00 to 41.00
No. 2 bundles.....	40.00 to 41.00
Mach. shop turn.....	35.00 to 36.00
Shoveling turn.....	37.00 to 38.00
Cast iron borings.....	36.00 to 37.00
Mixed bor. & turn.....	35.00 to 36.00
Low phos., 18 in. under.....	52.00 to 53.00
No. 1 cupola cast.....	66.00 to 68.00
Hvy. breakable cast.....	60.00 to 61.00
Rails 18 in. and under.....	63.00 to 65.00
Rails random length.....	57.00 to 59.00
Drop broken.....	71.00 to 72.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 heavy, melting.....	\$34.40
No. 1 hvy. melting.....	34.40
No. 1 and 2 bundles.....	34.40
Busheling.....	34.40
Shoveling turn.....	31.40
Machine shop turn.....	29.40
Mixed bor. and turn.....	29.40
Cl'n cast chem. bor.....	36.00 to 37.00
No. 1 machinery cast.....	64.00 to 65.00
No. 2 machinery case.....	57.00 to 57.50
Heavy breakable cast.....	53.50 to 54.50
Stove plate.....	51.00 to 51.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting.....	\$33.00
No. 2 hvy. melting.....	28.00
No. 1 bundles.....	33.00
New busheling.....	33.00
Flashings.....	33.00
Mach. shop turn.....	\$32.50 to 33.00
Shoveling turn.....	34.50 to 35.00
Cast iron borings.....	33.50 to 34.00
Mixed bor. & turn.....	34.50 to 35.00
Low phos. plate.....	42.50 to 43.00
No. 1 cupola cast.....	56.00 to 59.00
Heavy breakable cast.....	51.00 to 54.00
Stove plate.....	53.00 to 54.00
Automotive cast.....	57.00 to 59.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$44.50 to \$45.50
No. 2 hvy. melting.....	41.00 to 41.50
No. 1 bundles.....	44.50 to 45.50
No. 2 bundles.....	41.00 to 41.50
Mach. shop turn.....	36.50 to 37.50
Shoveling turn.....	33.00 to 33.50
Mixed bor. and turn.....	36.50 to 37.50
Clean cast chemical bor.....	41.50 to 42.00
No. 1 machinery cast.....	65.00 to 66.00
No. 1 mixed yard cast.....	60.00 to 62.00
Hvy. breakable cast.....	61.50 to 62.50
Clean auto cast.....	65.00 to 66.00
Hvy. axle forge turn.....	46.50 to 47.50
Low phos. plate.....	49.50 to 50.50
Low phos. punchings.....	49.50 to 50.50
Low phos. bundles.....	47.00 to 48.00
RR. steel wheels.....	53.00 to 54.00
RR. coil springs.....	53.00 to 54.00
RR. malleable.....	75.00 to 78.00
Cast iron carwheels.....	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$43.00 to \$44.00
No. 2 hvy. melting.....	40.00 to 41.00
Bundled sheets.....	40.00 to 41.00
Mach. shop turn.....	35.00 to 36.00
Shoveling turnings.....	37.00 to 38.00
Locomotive tires, uncut.....	50.00 to 51.00
Mis. std. sec. rails.....	52.00 to 54.00
Steel angle bars.....	54.00 to 55.00
Rails 3 ft and under.....	58.00 to 60.00
RR. steel springs.....	51.00 to 52.00
Steel car axles.....	56.00 to 57.00
Grate bars.....	59.00 to 60.00
Brake shoes.....	59.00 to 60.00
Malleable.....	72.00 to 73.00
Cast iron car wheels.....	61.00 to 62.00
No. 1 machinery cast.....	65.00 to 67.00
Hvy. breakable cast.....	59.00 to 60.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	 \$40.00
No. 2 hvy. melting.....	 40.00
No. 2 bundles.....	 40.00
No. 1 busheling.....	 40.00
Long turnings.....	27.50 to 28.50
Shoveling turnings.....	29.50 to 30.50
Cast iron borings.....	 29.00
Bar crops and plate.....	44.00 to 45.00
Structural and plate.....	44.00 to 45.00
No. 1 cupola cast.....	64.00 to 67.00
Stove plate.....	63.00 to 64.00
No. 1 RR. hvy. melt.....	 41.00
Steel axles.....	51.00 to 52.00
Scrap rails.....	44.00 to 45.00
Rerolling rails.....	55.00 to 57.00
Angles & splice bars.....	51.00 to 53.00
Rails 3 ft & under.....	52.00 to 55.00
Cast iron carwheels.....	50.00 to 55.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$42.50 to \$43.00
No. 2 hvy. melting.....	42.50 to 43.00
Mach. shop turn.....	37.50 to 38.00
Short shov. turn.....	39.50 to 40.00
Cast iron borings.....	38.50 to 39.00
Low phos.....	47.50 to 48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting.....	\$32.50 to \$33.00
No. 2 hvy. melting.....	 27.00
No. 2 bundles.....	 37.00
Mach. shop turn.....	31.50 to 32.00
Mixed bor. & turn.....	31.50 to 32.00
Shoveling turnings.....	33.50 to 34.00
No. 1 cupola cast.....	57.50 to 58.50
Clean auto cast.....	57.50 to 58.50
Hvy. breakable cast.....	56.00 to 57.00
Charging box cast.....	56.00 to 57.00
Unstrp motor blks.....	55.00 to 56.00
Cl'n cast chem. bor.....	35.50 to 36.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$46.00 to 47.00
No. 2 heavy, melting.....	41.75 to 42.75
No. 1 bundles.....	41.75 to 42.75
No. 2 bundles.....	41.75 to 42.75
No. 1 busheling.....	41.75 to 42.75
Mach. shop turn.....	36.75 to 37.75
Shoveling turn.....	38.75 to 39.75
Cast iron borings.....	34.75 to 35.75
Mixed bor. and turn.....	36.75 to 37.75
Clean auto cast.....	63.00 to 64.00
Mixed cupola cast.....	63.00 to 64.00
Charging box cast.....	59.00 to 60.00
Stove plate.....	62.00 to 63.00
Stove auto cast.....	60.00 to 61.00
RR. malleable.....	70.00 to 71.00
Small indl. malleable.....	47.00 to 48.00
Low phos. plate.....	47.25 to 48.25
Scrap rails.....	50.00 to 51.00
Rails 3 ft & under.....	57.00 to 58.00
RR steel wheels.....	51.00 to 52.00
Cast iron carwheels.....	51.00 to 52.00
RR. coil & leaf spgs.....	51.00 to 52.00
RR. knuckles & coup.....	51.00 to 52.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$42.00 to 43.00
No. 2 hvy. melting.....	42.00 to 43.00
No. 1 bundles.....	42.00 to 43.00
No. 1 busheling.....	42.00 to 43.00
Drop forge flashings.....	42.00 to 43.00
Mach. shop turn.....	37.00 to 38.00
Shoveling turn.....	32.00 to 33.00
Steel axle turn.....	42.00 to 43.00
Cast iron borings.....	33.00 to 34.00
Mixed bor. & turn.....	33.00 to 34.00
Low phos.....	47.00 to 48.00
No. 1 machinery cast.....	72.00 to 73.00
Malleable.....	79.00 to 80.00
RR. cast.....	76.00 to 77.00
Railroad grate bars.....	60.00 to 61.00
Stove plate.....	61.00 to 62.00
RR. hvy. melting.....	43.00 to 44.00
Rails 3 ft and under.....	63.50 to 64.50
Rails 18 in. and under.....	65.00 to 66.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting.....	 \$
No. 2 hvy. melting.....	 \$
No. 3 bales.....	 \$
Mach. shop turn.....	 \$
Elec. fur. 1 ft under.....	36.00 to 37.00
No. 1 cupola cast.....	50.00 to 51.00
RR. hvy. melting.....	 \$
Rails.....	 \$

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting.....	 \$
No. 2 hvy. melting.....	 \$
No. 1 bales.....	 \$
No. 2 bales.....	 \$
No. 3 bales.....	 \$
Mach. shop turn.....	 \$
No. 1 cupola cast.....	45.00 to 46.00
RR. hvy. melting.....	 \$

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.....	 \$
Elec. furn. 1 ft and under.....	 \$
No. 1 cupola cast.....	40.00 to 41.00
RR. hvy. melting.....	 \$

HAMILTON, ONT.

Per gross ton delivered to consumer:

Cast grades f.o.b. shipping point.....	 \$
Heavy melting.....	\$2
No. 1 bundles.....	2
No. 2 bundles.....	2
Mechanical bundles.....	2
Mixed steel scrap.....	1
Mixed borings and turnings.....	1
Rails, remelting.....	2
Rails, rerolling.....	2
Bushelings.....	1
Bushelings, new fact, prop'd.....	2
Bushelings, new fact, unprep'd.....	1
Short steel turnings.....	1
No. 1 cast.....	42.00 to 43.00
No. 2 cast.....	35.00 to 36.00
*Ceiling Price.....	 \$

Strikes Create Snag; Producers Hard Pressed By Consumer Demand

New York

• • Consumer demand for copper, lead and zinc is pressing hard on producers of all three metals who are unable to cope with overall requirements due principally to strikes at the plants of important lead and zinc producers and an unauthorized strike action at the Hurst, New Mexico plant of Kennecott Copper Corp., where the men walked out last week leaving the plant in the fire refined casting machine, despite the decision of top officials of the CIO Mine Mill and Smelter Workers to continue the men at work. This unauthorized walkout is estimated to tie up this plant's production for a minimum of 2 weeks.

The strikes at the St. Joseph Lead Co. plants in Missouri, and the American Lead Co., subsidiary of National Lead Co., secondary lead smelters, have been in effect for 7 weeks and it is estimated that there has been a total loss of lead production of over 15,000 tons at this time. There is no early prospect of an adjustment of these strikes, as neither company nor union officials show any willingness to begin negotiations.

The Eagle Pitcher strike continues to restrict the zinc production in the tri-state district and during the week three plants of American Lead & Smelting Co., at Hillsboro and Fairmount, Ill., and Columbus, Ohio, went out on strike. The zinc supply situation is fast becoming almost as critical as the lead shortage. Brass mills striving to meet their production schedules are suffering acutely from shortages of copper and zinc and the small amounts of lead they require. It was learned, however, that the metals reserve stockpile is the source of some 2000 to 3000 tons of zinc for late August shipment. This tonnage consists principally of high grade, but also includes a little prime western. A previous announcement of the Office of Metals Reserve had indicated that the stockpile of zinc had been closed to consumers, but with the present shortage it was apparently necessary to reopen it for the most critical

needs. However, once again the announcement is accompanied by the statement that no further allocations of zinc will be made from the stockpile.

In addition to the effect of the strikes in tying up production of nonferrous metals, there is also the program for accelerated strategic stockpiling which is said by producers to be almost ineffectual so far as these three metals are concerned. Regardless of how small the tonnages going into the metals stockpile at this time, there is no doubt that they exert an important restricting effect on consumers' supplies and thereby encourage inflationary trends in the market.

One important consumer of copper has made a public statement deploring the inflationary price effects of even small stockpiling ac-

tivities for copper and zinc. C. Donald Dallas, chairman of the board, Revere Copper & Brass, Inc., addressed a letter to Chairman Hargrave of the Munitions Board proposing an alternative program under which brass obtained from scrap might be stockpiled instead of primary copper and zinc. Mr. Dallas points out that previous wartime experience indicates the most urgent demand for these metals is likely to be for cartridge brasses containing approximately 70 pct copper and 30 pct zinc. He recommends that the government services canvass their sources of brass scrap to determine whether the maximum quantity is being salvaged and converting it into a controlled alloy in cakes suitable for rolling by mills at present in operation.

Canadian Titanium

New York

• • • Kennco Exploration, Ltd., owned two thirds by the Kennecott Copper Corp. and one third by New Jersey Zinc Co., plans to expend \$25 million in the development of a large titanium ore deposit in the province of Quebec. A railroad, costing around \$10 million and a refinery, about \$15 million, will be among the first construction projects. Eventually, some \$150 million is expected to be expended in developing the ore body. One of the first products the new company expects to produce is pig iron. Millions of tons of ore in commercial quantities are already mapped out.

Some market observers recognize that surplus funds now available in the hands of some nonferrous metals producers make it possible

for them to enter fields outside of their former scope of activities.

Aluminum Smelting Merger

Cleveland

• • • More than \$50,000 will be spent for new equipment at Aluminum Smelting & Refining Co. and its sales force will be merged with that of Certified Alloys Co. A group of investors purchased Aluminum Smelting from Mrs. Marie K. Ripner who operated the plant for many years after her husband's death. The company is located at 5463 Dunham Road, Maple Heights, and sold for \$300,000 with the building rented for \$15,000 a year for 5 years and option to buy.

Certified Alloys makes zinc alloy ingots. Its office is in the Leader Bldg. and the plant at 3915 E. 91st St.

Nonferrous Metals Prices

	Aug. 18	Aug. 19	Aug. 20	Aug. 21	Aug. 23	Aug. 24
Copper, electro, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn.	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	19.30	19.30	19.30	19.30	19.30	19.30

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	16.00 to 17.00
Aluminum pig	15.00 to 16.00
Antimony, American, Laredo, Tex.	35.00
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$40.00
Cadmium, del'd	\$1.90
Cobalt, 97-99% (per lb)	\$1.65 to \$1.72
Copper electro, Conn. Valley	23.50
Copper, lake, Conn. Valley	23.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$110 to \$120
Lead, St. Louis	19.30
Lead, New York	19.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$76 to \$78
Nickel, electro, f.o.b. New York	42.90
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$93 to \$96
Silver, New York, cents per oz.	73.5
Tin, Grade A, New York	1.03
Zinc, East St. Louis	15.00
Zinc, New York	15.65
Zirconium copper, 20 pct Zr, per lb contained Zr	\$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	21.00-22.00
No. 120	20.50-21.50
No. 123	20.00-21.00
80-10-10 ingot	
No. 305	27.25
No. 315	24.25
88-10-2 ingot	
No. 210	33.00
No. 215	31.00
No. 245	24.75-25.75
Yellow ingot	
No. 405	16.25-17.50
Manganese bronze	
No. 421	23.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	26.50-27.50
0.60 copper, max.	26.50-27.00
Piston alloys (No. 122 type)	24.25-24.75
No. 12 alum. (No. 2 grade)	23.50-24.00
108 alloy	23.50-24.25
195 alloy	23.50-24.50
13 alloy	26.00-27.00
AXS-679	24.00-24.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1-95 pct.-95½ pct.	24.50-25.50
Grade 2-92 pct.-95 pct.	24.00-25.00
Grade 3-90 pct.-92 pct.	23.00-24.00
Grade 4-85 pct.-90 pct.	23.50-24.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, ft. allowed	
Cast, oval, 15 in. or longer	40½
Electrodeposited	34½
Rolled, oval, straight, delivered	37.34
Rolled, oval, 18 in. or longer	35½
Ball anodes	30½
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	35½
Zinc, cast, 99.99	20.50
Nickel 99 pct plus, frt. allowed	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	\$2.00
Silver 999 fine	
Rolled, 100 oz lots per troy oz.	67½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46.00
Copper sulfate, 99.5, crystals, bbls.	12.50
Nickel salts, single or double, 425 lb bbls, frt. allowed	18.00
Nickel chloride, 300 lb bbl	24.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct domestic, 100 lb drums	16.00
Zinc cyanide, 10 lb drums	37.00
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.90

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 25.7¢; 4S, 61S-O, 27.8¢; 52S, 29.9¢; 24S-O, 24S-OAL, 28.8¢; 75S-O, 75S-OAL, 35.3¢. 0.081 in., 2S, 3S, 26.8¢; 4S, 61S-O, 29.2¢; 52S, 31.3¢; 24S-O, 24S-OAL, 29.9¢; 75S-O, 75S-OAL, 37.0¢. 0.032 in., 2S, 3S, 28.5¢; 4S, 61S-O, 32.5¢; 52S, 35.2¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 46.6¢.	
Plate: ¼ in. and heavier: 2S, 3S, 22.8¢; 4S-F, 25.0¢; 52S, 26.1¢; 61S-O, 25.6¢; 24S-F, 24S-FAL, 26.1¢; 75S, 75S-AL, 32.9¢.	
Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69¢; 23 to 25, 33.4¢ to 90¢; 35 to 37, 40.8¢ to \$1.25; 47 to 49, 58.7¢ to \$1.84.	
Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ¾ to 1 in., 29¢ to 43¢; 1 to 1½ in., 30¢ to 46.5¢; 1½ to 2 in., 32.5¢ to 53.5¢; 9/64 to ¾ in., 35.5¢ to 62¢.	
Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 33¢ to 29.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 35.5¢ to 81¢.	
Screw Machine Stock: Drawn, ½ to 1½ in., 11S-T3, R317-T4, 43¢ to 34¢; cold-finished, ½ to 1½ in., 11S-T3, 37.5¢ to 34.5¢; ¾ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1½ to 8 in., 11S-T3, 34.5¢ to 31.5¢; 2½ to 3½ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.	
Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 35¢ to 25.5¢; 52S, 43¢ to 31¢; 56S, 45.5¢ to 37¢; 17S-T4, 49¢ to 38.5¢; 61S-T4, 43.5¢ to 33¢; 75S-T6, 75¢ to 54¢.	

Magnesium

(Cents per lb, f.o.b. mill, freight allowed.)

Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSA. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 69¢-61¢; 12, 68¢-66¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢ 20, 96¢-\$1.01; 22, \$1.22-\$1.81; 24, \$1.62-\$1.75. Specification grade higher.	
Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1½ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.	
Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to ¾, 48¢; 1½ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.	
Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft, per. up to 8.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.	
Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to ¾, \$1.14; ¾ to 1, \$1.02; 1 to 2, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ¾ to 1, 85¢; ¾ to 1, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ¾ to 1, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.	

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	53	46
Seamless tubes	39	30
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78		37.18
Copper, hot-rolled		33.28	
Copper, drawn		34.28	
Low brass	38.07*	34.85	35.16
Yellow brass	36.76*	33.44	33.75
Red brass	38.55*	35.33	35.64
Naval brass	33.92	32.67	38.61
Leaded brass		28.30	
Commercial bronze	39.29*	36.32	36.63
Manganese bronze	37.51	36.01	42.11
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	33.47	32.22	36.66
Everdur, Herculey, Olympic, etc.	40.43	40.67	41.73
Nickel silver, 10 pct		46.42	44.20
Architectural bronze			32.33
* Seamless tubing.			

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipping of 15,000 lb or more.)

	Heavy
Copper	21½
Yellow brass	18
Red brass	19½
Commercial bronze	19½
Manganese bronze	17½
Leaded brass rod ends	17½

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered refinery.)

No. 1 copper wire	20.25-20.50
No. 2 copper wire	19
Light copper	18
Refinery brass	18.00-18.50
* Dry copper content.	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered producer.)

No. 1 copper, wire	19
No. 2 copper, wire	18
Light copper	17
No. 1 composition	16
No. 1 comp. turnings	16
Rolled brass	12
Brass pipe	12
Radiators	13
Heavy yellow brass	12

Aluminum

Mixed old cast	11
Mixed old clips	11
Mixed turnings, dry	11
Pots and pans	12
Low copper	12

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

	Copper and Brass
No. 1 heavy copper and wire	13
No. 2 heavy copper and wire	17
Light copper	16
Auto radiators (unsweated)	11½
No. 1 composition	13½
No. 1 composition turnings	13½
Clean red car boxes	10½
Cocks and faucets	10½
Mixed heavy yellow brass	8½
Old rolled brass	10½
Brass pipe	10½
New soft brass clippings	13½
Brass rod ends	11
No. 1 brass rod turnings	10½

Aluminum

Alum. pistons and struts	8
Aluminum crankcases	10½
2S aluminum clippings	12
Old sheet & utensils	10½
Borings and turnings	5
Misc. cast aluminum	10½
Dural clips (24S)	10½

Zinc

New zinc clippings	10
Old zinc	7½
Zinc routings	4
Old die cast scrap	4½

Nickel and Monel

Pure nickel clippings	19
Clean nickel turnings	15
Nickel anodes	18
Nickel rod ends	19
New Monel clippings	14
Clean Monel turnings	10
Old sheet Monel	12
Old Monel castings	10
Inconel clippings	8
Nickel silver clippings, mixed	8
Nickel silver turnings, mixed	6½

Lead

Soft scrap lead	17
Battery plates (dry)	11

Magnesium Alloys

Segregated solids	8
Castings	4½

Miscellaneous

Block tin	81
No. 1 pewter	65
No. 1 auto babbitt	51
Mixed common babbitt	14½
Solder joints	19½
Siphon tops	50
Small foundry type	20
Monotype	19
Lino. and stereotype	18
Electrotype	16½
New type shell cuttings	15
Hand picked type shells	6½
Lino and stereo dross	9½
Electro dross	6½

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas.													
	Fitts-burgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		Detroit	Johnstown	Seattle, S. Frisco, Los Angeles
INGOTS														
Carbon forging	\$50.00													
Alloy	\$51.00							(per net ton)						
BILLETS, BLOOMS, SLABS					\$52.00	\$52.00		(per net ton)					\$52.00	
Carbon, rerolling ¹²														
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00		(per net ton)					\$61.00	
Alloy	\$63.00	\$63.00				63.00		(Bethlehem, Canton, Massillon = \$63.00) (per net ton)						
PIPE SKELP	3.25						3.25				Warren = 3.25			
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.40			Worcester 3.70		3.40	4.05 ¹³ 4.10 ¹⁴
SHEETS														
Hot-rolled ⁴	3.25 to 3.30	3.25	3.25	3.25-3.30	3.25	3.25	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95 ¹⁵
Cold-rolled ¹	4.00	4.00 to 4.25	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20		
Galvanized (10 gage)	4.40	4.40	4.40		4.40				Canton = 4.40	4.40	Ashland = 4.40			5.15 ¹⁵
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70		
Long ternes ² (10 gage)	4.80		4.80							4.80				
STRIP														
Hot-rolled ³	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren = 3.25	3.45		4.00 to 4.25
Cold-rolled ⁴	4.00	4.25		4.00	4.00	4.00	4.00	4.00			New Haven, Ashland = 4.00 to 4.25	4.20 to 4.50		
TINPLATE														
Cokes, 1.50 lb. ⁵ base box	6.80	6.80	6.80		6.90			6.90	6.90		Warren, Ohio = \$6.80			
Electrolytic 0.25, 0.50, 0.75 lb, box														
TERNES MFG., special coated														
BLACKPLATE CANMAKING 55-70 lb, 75-95 lb, 100-128 lb														
BLACKPLATE, h.e., 29 ga. ¹⁰	4.75	4.75	4.75					4.85						
BARS														
Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35		3.35	4.05 to 4.10
Reinforcing (billet) ⁷	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10
Cold-finished ⁸	3.95 to 4.00	4.00	4.00	4.00			4.00					4.30		
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75			Bethlehem, Canton, Massillon = 3.75			3.75	4.80 ¹⁴
Alloy, cold-drawn										Massillon = 4.65				
PLATE														
Carbon steel ¹¹	3.40 to 3.60	3.40	3.40	3.40	3.40	3.45	3.40		Coatesville = 3.75, Claymont = 3.95 Geneva, Utah = 3.40, Harrisburg = 5.85			3.65	3.45	4.30 ¹⁶
Floor plates	4.55	4.55		4.55										
Alloy	4.40	4.40								Coatesville = 5.10				
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30			Bethlehem = 3.30, Geneva, Utah = 3.25				3.30	3.85 to 4.30
MANUFACTURERS' WIRE ⁹														
Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.50	4.25	Duluth = 4.15 Worcester = 4.45				4.15	5.10 ¹³
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-6.15
PILING, Steel sheet	4.05	4.05				4.05								

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. producing point

Product	Chromium Nickel			Straight Chromium		
	No. 304	No. 302	No. 410	No. 420	No. 442	No. 446
Billets, forging	25.25— 27.75	24.75— 24.50	19.25— 21.50	19.25— 21.75	23.00	28.00— 30.25
Bars, hot-rolled	29.25— 30.00	28.50	22.50— 23.00	23.00— 23.50	27.00	33.00— 32.50
Bars, cold-finished	29.25— 30.00	28.50	22.50— 23.00	23.00— 23.50	27.00	33.00— 32.50
Plates	34.75— 34.00	32.50— 32.00	25.75— 24.00	26.50	30.75	36.25— 35.50
Shapes, structural	29.25— 30.00	28.50	22.50— 23.00	23.00— 23.50	27.00	33.00— 32.50
Sheets	43.00— 39.50	40.75— 37.50	32.00— 33.00	34.75— 35.50	39.00	43.50— 50.00
Strip, hot-rolled	28.00— 27.75	25.75	20.25— 21.25	21.00— 21.75	28.50	41.75— 45.00
Strip, cold-rolled	35.75— 35.00	33.50— 33.00	26.50— 27.00	27.00— 27.50	38.50	62.25— 60.00
Wire, cold-drawn	29.25— 30.00	28.50	22.50— 23.00	23.00— 23.50	27.00	33.00— 32.50
Wire, flat, cold-rolled	35.75	33.25	26.25	26.75	38.25	62.00
Rod, hot-rolled	29.75	28.50	22.00	22.50	26.75	31.75
Piping, seamless	79.25	79.25	.....	75.25	.....	.....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	14.00¢
8 to 16	48, 60, 72	14.50¢
7	48, 60	15.75¢
6	48, 60	17.00¢
4, 5	40	17.50¢
3	40	18.50¢
2½	24, 30	19.00¢
2	24, 30	21.00¢
Carbon		
40	100, 110	6.75¢
35	65, 110	6.75¢
80	65, 84, 110	6.75¢
24	72 to 104	6.75¢
17 to 20	84, 90	6.75¢
14	60, 72	7.25¢
10, 12	60	7.50¢
8	60	7.75¢

TOOL STEEL

F.o.b. mill

Cr.	V	Mo	Co	Base per lb
4	1	—	—	90.5¢
4	1	—	5	\$1.42
4	2	—	—	\$1.025
4	1.5	8	—	65¢
4	2	6	—	69.5¢
Chromium-chromium				52¢
Garden manganese				29¢
Al carbon				26.5¢
Al carbon				22¢
Al carbon				19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

Base all grades f.o.b. mill

	Cents per lb
Aluminum	5.45
Aluminum	5.95 to 6.15
Aluminum	6.90 to 7.20
Aluminum	7.50 to 7.90
Aluminum 72	8.05 to 8.90
Aluminum 65	8.60 to 9.60
Aluminum 58	9.30 to 10.30
Aluminum 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, 1 O.H., per 100 lb.....	\$3.20
Bars, 100 lb.....	4.25
Rails (from billets) 100 lb	3.55

Base per lb

Spikes	5.35¢
Spikes	8.00¢
Plate, steel	4.05¢
Plates, Pittsburgh, Calif.*.....	4.20¢
Bolts	7.50¢
Bolts, heat treated, to rail- roads	8.50¢
Washers, add 30¢.	

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon.....	4.00¢
0.41 to 0.60 carbon.....	5.50¢
0.61 to 0.80 carbon.....	6.10¢
0.81 to 1.05 carbon.....	8.05¢
1.06 to 1.25 carbon.....	10.35¢
Worcester, add 0.30¢	

CLAD STEEL

Base prices, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Coatesville, Pa.	*27.00	
Nickel-clad 10 pct f.o.b. Coatesville, Pa.	27.50	
Inconel-clad 10 pct, f.o.b. Coatesville..	36.00	
Monel-clad 10 pct, f.o.b. Coatesville..	29.00	
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	7.75	

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails* 103	123
Galvanized nails*	123
Woven wire fence†.....	109
Fence posts, carload††. 114	...
Single loop bale ties.....	106
Galvanized barbed wire** 123	143
Twisted barbed wire... 123	...

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

	Base per 100 lb	Pittsburg, Calif.
Annealed fence wire†...\$4.80	\$5.75	
Annealed, galv. fencing†. 5.25	6.20	
Cut nails, carload†..... 6.75	...	

† Add 30¢ at Worcester; 10¢ at Sparrows Pt. (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

mill prices, cents per pound

Steel	Aldi- cor	Corten	Double Strength No. 1	Dyn- alloy	Hi Steel	Mayari R	Ole- coloy	Yeloy	NAX High Tensile
Producer	Repub- lic	Carnegie- Illinois, Republic	Repub- lic	Alan Wood	Inland	Bethle- hem	Jones & Laughlin	Youngs- town Sheet & Tube	Great Lakes Steel
Plates.....	5.20	5.20	5.20	5.30	5.20	5.20	5.20	5.20	5.66
Sheets									
Hot-rolled...	4.95	4.95	4.95	5.25	4.95	4.95	4.95	4.95	5.25
Cold-rolled...	6.05	6.05	6.05	....	6.05	6.05	6.05	6.05	6.35
Galvanized...	....	6.75	....	....	....	6.75	....	....	....
Strip									
Hot-rolled...	4.95	4.95	4.95	....	4.95	4.95	4.95	4.95	5.25
Cold-rolled...	....	....	6.05	....	....	6.05	6.05	....	6.35
Shapes .....	....	4.95	....	....	4.95	4.95	4.95	....	....
Beams.....	....	4.95	....	....	....	....	....	....	....
Bars									
Hot-rolled...	5.10	5.10	5.10	....	6.10	5.10	5.10	....	5.40
Bar shapes.....	....	5.10	....	....	5.10	5.10	5.10	....	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. mills, steel butt weld and seamless. Base price, \$200.00 per net ton.

Standard, threaded and coupled

Steel, butt weld*	Black	Galv.
¾-in.	46	29½
1-in.	48½	32½
1¼-in.	49	33
1½-in.	49½	33½
2-in.	50	34
2½ and 3-in.	50½	34½

Wrought Iron, butt weld		
¾-in.	+20½	+46
1-in.	+10½	+35
1 and 1¼-in.	+4½	+26
2-in.	+1½	+22½
2-in.	-2	+22

Steel, lap weld		
2-in.	39½	23
2½ and 3-in.	43½	27
3½ to 6-in.	45½	29

Steel, seamless		
2-in.	38½	22
2½ and 3-in.	41½	25
3½ to 6-in.	43½	27

Wrought Iron, lap weld		
2-in.	+7½	+30
2½ to 3½-in.	+5	+25½
4-in.	+11st	+19½
4½ to 8-in.	+2	+21

Extra Strong, plain ends

Steel, butt weld		
¾-in.	41	25
¾-in.	45	29
1-in.	47	32
1¼-in.	47½	32½
1½-in.	48	33
2-in.	48½	33½
2½ and 3-in.	49	34

Wrought Iron, butt weld		
¾-in.	+16	+40
¾-in.	+9½	+33
1 to 2 in.	-1½	+22

Steel, lap weld		
2-in.	38½	23
2½ and 3-in.	43½	28
3½ to 6-in.	45½	29

Steel, seamless		
2-in.	37½	22
2½ and 3-in.	41½	26
3½ and 6-in.	45	29½

Wrought Iron, lap weld		
2-in.	+4½	+26½
2½ to 4-in.	-5	+15
4½ to 6-in.	-1	+19½

Basing discounts for standard pipe are for threads and couplings. For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt weld. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

*F.o.b. Fontana prices average 17 points lower discount (higher price).

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft. at mill in carload lots, cut length 4 to 24 ft. inclusive.

OD	Gage	Seamless	Electric Weld
in.	BWG	H.R.	C.R.
2	13	19.18	22.56
2½	12	25.79	30.33
3	12	28.68	33.76
3½	11	35.85	42.20
4	10	44.51	52.35

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago.....	\$106.70
6 to 24-in., del'd N. Y.....	103.50 to 108.40
6 to 24-in., Birmingham.....	93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less.....	120.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter..	35
9/16 & ¾ in. x 6 in. & shorter.....	37
¾ in. & larger x 6 in. & shorter....	34
All diam, longer than 6 in.....	30
Lag, all diam over 6 in. longer.....	35
Lag, all diam x 6 in & shorter.....	37
Flow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller.....	35
9/16 to 1 in. inclusive.....	34
1¼ to 1½ in. inclusive.....	32
1½ in. and larger.....	27

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts USS SAE

7/16 in. and smaller	41
¾ in. and smaller.....	38
¾ in. through 1 in.	39
9/16 in. through 1 in.....	37
1¼ in. through 1½ in.	35
1½ in. and larger	28

In full case lots, 15 pct additional discount.

Stove Bolts

Packages, nuts separate.....	61.75
In bulk	70.00

Large Rivets

(½ in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

(In packages) Percent Off List

Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright.....	46
¾ to 1 in. x 6 in., SAE (1035), heat treated	35
Set screws, oval points	19
Milled studs	5
Flat head cap screws, listed sizes....	28
Fillister head cap, listed sizes.....	28

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF ₂ Content:	Base price per short ton
70% or more	\$35.00
65% but less than 70%.....	34.00
60% but less than 65%.....	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in 100 mesh.

Swedish sponge iron e.i.f.	7.9¢
New York, ocean bags.....	9.5¢
Domestic sponge iron, 98+ % Fe	19.5¢
Electrolytic iron, annealed, 99.5+ % Fe	63.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe.....	90.0¢
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe.....	300
Carbonyl iron, minus 300 mesh, 98%, 99.8+ % Fe.....	8.5¢ plus met
Aluminum	302
Antimony	99%
Brass	27.25 to
Copper, electrolytic	
Copper, reduced	
Cadmium	
Chromium, electrolytic, 99% min.	
Lead	
Manganese	
Molybdenum, 99%	
Nickel, unannealed	
Nickel, spherical, minus 30 Mesh, unannealed	
Silicon	
Solder powder	
Stainless steel, 302.....	
Tin	
Tungsten, 95%, 99%.....	

COKE

Furnace, beehive (f.o.b. oven) N	
Connellsville, Pa.	\$12.50 to
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to
Foundry, Byproduct	
Chicago, del'd	
Chicago, f.o.b.	
Detroit, f.o.b.	
New England, del'd	
Seaboard, N. J., f.o.b.	
Philadelphia, f.o.b.	
Swedeland, Pa., f.o.b.	
Ashland, Ohio, f.o.b.	
Painesville, Ohio, f.o.b.	
Erie, del'd	
Cleveland, del'd	
Cincinnati, del'd	
St. Louis, del'd	
Birmingham, del'd	

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, P
First quality, Pa., Md., Ky., Mo	
(except Salina, Pa., add \$5).....	
No. 1 Ohio	
Sec. quality, Pa., Md., Ky., Mo.....	
No. 2 Ohio	
Ground fire clay, net ton, bulk (ex	
cept Salina, Pa., add \$1.50).....	

Silica Brick

Mt. Union, Pa., Ensley, Ala.....	
Childs, Pa.	
Hays, Pa.	
Chicago District	
Western, Utah and Calif.....	
Super Duty, Hays, Pa., Athens, Tex	
Silica cement, net ton, bulk, East	
ern (except Hays, Pa.)....	\$13.75 t
Silica cement, net ton, bulk, Hays	
Pa.	
Silica cement, net ton, bulk, Ensley	
Ala.	
Silica cement, net ton, bulk, Chica	
go District	\$14.75 t
Silica cement, net ton, bulk, Utah	
and Calif.	

Chrome Brick

Standard chemically bonded, Balt. and Chester

Magnesite Brick

Standard, Balt., and Chester.....
Chemically bonded, Balt. and Chester

Grain Magnesite

Sid. ¾-in. grains	
Domestic, f.o.b. Balt. and Chester	
in bulk, fines removed.....	
Domestic, f.o.b. Chewelah, Wash.	
in bulk with fines.....	\$30.50 t
in sacks with fines.....	35.00 t

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio
pet net ton, bulk, Midwest, add
10¢; Missouri Valley, add 20¢....

PRICES

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.
(Metropolitan area delivery, add 15¢ to base, except New York, add 20¢)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	\$5.15-5.71	\$6.31-6.57	\$7.27-7.47	\$5.35-5.66	6.51	\$5.37-5.50	\$5.09-5.20	\$5.35-5.56	\$6.16-6.26	\$9.14	\$9.29	\$10.54	\$10.69
New York	5.40-5.98	6.28-6.43	7.25-7.54	5.58-5.88	6.73	5.78	5.32-5.58	5.53-5.83	6.18-6.38	9.17-9.53	9.32-9.68	10.40-10.77	10.55-10.92
Chicago	5.48-5.64	6.39	7.58-7.69	5.54-5.89	6.75-6.79	5.74	5.39-5.54	5.48-5.58	6.24-6.34	9.40-9.44	9.55-9.59	10.84-10.94	10.92-11.09
Pittsburgh	5.28	6.18	7.15-7.38	5.34	....	5.53	5.33	5.39	6.13	....	....	....	....
Cleveland	4.85	5.75	6.95-7.05	4.85	6.15	5.10	4.90	4.90	5.70	9.00	9.15	10.40	10.55
Detroit	5.02-5.07	5.92	7.12-7.22	5.02-5.37	6.32	5.22-5.27	5.07	5.07	5.87	9.15-9.17	9.32	10.52-10.57	10.67-10.72
Indianapolis	4.98-5.20	5.75-6.04	7.18-7.24	5.02-5.65	6.70	5.35-5.54	5.18-5.42	5.15-5.34	5.70-5.95	9.14-9.29	9.29-9.79	10.54	10.69
St. Louis	4.85-5.10	5.75-5.85	7.55-7.70	5.55-5.66	6.35	5.45-5.46	5.15-5.10	5.15-5.20	5.90-6.05	9.05-9.35	9.40-9.50	10.75	10.90
Kansas City	5.20-5.55	6.15-6.50	7.45	5.25-5.70	6.25-6.55	5.50-5.55	5.30-5.37	5.30-5.52	6.02-6.07	9.31-9.55	9.20-9.47	10.72-10.95	10.87-11.10
Memphis	5.14-5.36	5.82-6.21	6.97-7.45	5.25-5.62	....	5.50-5.71	5.30-5.47	5.30-5.62	6.06-6.17	9.31-9.35	9.50-9.51	10.75-10.76	10.90-10.91
San Antonio	5.19	6.04-6.09	7.29-7.39	5.19-5.79	6.49	5.39-5.44	5.24	5.24	6.04	9.34	9.49	10.74	10.89
San Diego	4.35-4.90	5.75-7.05	6.95-7.05	5.00-5.35	5.95	5.05-5.25	4.90-5.15	4.90-5.10	5.65-5.80	9.00	9.15	10.40	10.55-10.80
San Francisco	5.41	6.31	7.30-7.61	5.41	....	5.68	5.46	5.46	6.26	9.58	9.71	10.96	11.11
Portland, Ore.	5.92	....	9.18	5.92	....	6.17	5.97	5.97	6.77	....	....	....	....
Seattle	5.05-6.40	6.36	6.45	5.05-6.75	6.36	5.25-6.35	5.00-6.20	5.00-6.40	6.51-7.60	....	....	....	....
Portland, Me.	6.30-6.40	7.85-7.90	7.95-8.55	6.60-6.66	9.35	5.95-6.10	5.75-5.90	6.05-7.85	7.85-7.95	10.35-10.20	10.20-10.15	11.75-11.75	11.95-11.95
San Jose	5.95	7.15	7.85	6.40	....	6.30	5.90	5.90	7.55	10.35	10.20	11.75	11.95
Albany, N.Y.	6.20-6.30	7.75-7.85	7.65-8.00	6.55-6.65	....	6.20-6.30	6.15-6.25	6.05-6.15	8.00-8.10	....	10.30-10.40	....	12.00-12.05
Buffalo	6.15-7.05	....	8.30-8.45	7.10-7.35	....	5.75-6.40	6.65-6.80	6.95-7.25	7.55-8.15	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

Hot-Rolled: Sheets, strip, plates, shapes
bars, 400 to 1999 lb.

Cold-Rolled: Sheets, 400 to 1999 lb;

strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to

9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES† (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Chenango	44.00	44.50	45.00	45.50	.....	Boston	Everett	\$0.50 Arb.	.....	48.75	49.25	.....	.....
Chenango	42.88	43.38	.....	.....	.....	Boston	Steelton	6.27	50.27	50.77	51.27	51.77	56.27
.....	44.00	44.00	44.50	.....	.....	Brooklyn	Bethlehem	3.90	47.90	48.40	48.90	49.40	.....
.....	46.00*	46.00*	46.50*	.....	.....	Cincinnati	Birmingham	6.09	48.97	49.47	.....	.....	.....
.....	43.00	43.00	43.50	44.00	.....	Jersey City	Bethlehem	2.39	46.39	46.89	47.39	47.89	.....
.....	43.00	43.50	43.50	44.00	48.00	Los Angeles	Provo	6.93	49.93	50.43	.....	.....	.....
.....	43.00	43.50	44.00	44.50	.....	Mansfield	Cleveland-Toledo	3.03	45.53	46.03	46.53	47.03	.....
.....	42.50	43.00	43.50	44.00	.....	Philadelphia	Bethlehem	2.21	46.21	46.71	47.21	47.71	.....
.....	48.75	48.25	.....	.....	.....	Philadelphia	Swedeland	1.31	51.31	51.81	52.31	52.81	.....
.....	47.90	48.40	48.90	.....	.....	Philadelphia	Steelton	2.81	46.81	47.31	47.81	48.31	62.81
.....	46.00	46.50	.....	.....	.....	San Francisco	Provo	6.93	49.93	50.43	.....	.....	.....
.....	43.00	43.50	43.50	44.00	.....	Seattle	Provo	6.93	49.93	50.43	.....	.....	.....
.....	44.00	44.50	45.00	45.50	50.00	St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
.....	42.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	50.00	50.50	51.00	51.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	42.50	43.00	43.50	44.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	43.00	43.50	43.50	44.00	50.00	.....	.....	.....	.....	.....	.....	.....	.....

Republic Steel Corp. price: Basis: pig iron at Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Buffalo as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Producing point prices are subject to switch-charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.00 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.015 pct and over; manganese differentials, a reduction of 50¢ per ton for each 0.01 pct manganese content in excess of 1.00

pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —\$56.50; f.o.b. Buffalo—\$57.75. Add \$1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$62.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$69.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Phila., New York.....\$145
 F.o.b. Birmingham.....\$150
 F.o.b. Niagara Falls, Alloy, W. Va., Wel-land, Ont.\$145
 Carload lots (bulk)\$145
 F.o.b. Rockwood, Tenn.\$150
 Less ton lots (packed).....\$189
 F.o.b. Btina, Pa.\$148
 \$1.80 for each 1% above 82% Mn; penalty, \$1.80 for each 1% below 78%
 Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.
 Eastern Central Western
 Carload, bulk ... 8.70 8.95 9.50
 Ton lots 10.30 10.90 12.80
 Less ton lots ... 11.20 11.80 13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.
 16-19% Mn 19-21% Mn
 3% max. Si 3% max. Si
 Carloads\$51.00 \$52.00
 F.o.b. Pittsburgh.. 55.00 56.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.
 96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.
 Carload, bulk 32
 L.c.l. lots 34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
 Carloads 32
 Ton lots 34
 Less ton lots 36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.
 Carload bulk 7.80
 Ton lots 9.45
 Briquet, contract, basis, carlots, bulk freight allowed, per lb of briquet 8.75
 Ton lots 10.35
 Less ton lots 11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth \$81.00, foundry, \$82.00; \$81.75 f.o.b. Niagara Falls; \$77.50 f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.
 Eastern Central Western
 96% Si, 1% Fe.. 16.90 17.50 18.10
 97% Si, 1% Fe.. 17.30 17.90 18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.
 Eastern Central Western
 Carload, bulk ... 5.25 5.50 5.70
 Ton lots 6.85 7.45 7.75
 Less ton lots ... 7.75 8.35 8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 25% Si 16.50
 50% Si 9.30 9.80 10.00
 75% Si 11.80 12.10 12.85
 85% Si 13.30 13.60 14.35
 90% Si 15.00 15.30 16.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.
 Cast Turnings Distilled
 Ton lots\$1.85 \$2.70 \$3.40
 Less ton lots 2.20 3.05 4.20

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, Contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 0.06% C 26.50 26.90 27.00
 0.10% C 26.00 26.40 26.50
 0.15% C 25.50 25.90 26.00
 0.20% C 25.25 25.65 25.75
 0.50% C 25.00 25.40 25.50
 1.00% C 24.50 24.90 25.00
 2.00% C 24.25 24.65 24.75
 65-69% Cr, 4-9% C 18.60 19.00 19.15
 62-66% Cr, 4-6% C, 6-9% Si. 19.45 19.85 20.00
 Briquets—Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.
 Eastern Central Western
 Carload, bulk ... 12.50 12.75 12.85
 Ton lots 14.00 14.90 15.50
 Less ton lots ... 14.90 15.80 16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
 Eastern Central Western
 Carload 19.70 20.10 20.25
 Ton lots 21.85 23.15 23.95
 Less ton lots ... 23.35 24.65 25.45
 Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.
 Eastern Central Western
 Carload 25.00 25.40 25.50
 Ton lots 27.30 27.95 29.15
 Less ton lots ... 29.10 29.75 30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.
 Eastern Central Western
 0.20% max. C. .. 97.00 98.50 99.75
 0.50% max. C. .. 93.00 94.50 95.75
 9.00% min. C. .. 91.50 93.00 94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 30-35% Ca, 60-65% Si, 8.00% max. Fe
 Cr 28-32% Ca, 60-65% Si, 6.00% max. Fe.
 Eastern Central Western
 Carloads 16.25 16.75 18.30
 Ton lots 19.35 20.10 22.25
 Less ton lots ... 20.35 21.60 23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 16-20% Ca, 14-18% Mn, 53-59% Si.
 Eastern Central Western
 Carloads 17.50 18.00 20.05
 Ton lots 19.80 20.65 22.40
 Less ton lots ... 20.80 21.65 23.40

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.
 Eastern Central Western
 Ton lots 18.00 19.10 21.05
 Less ton lots ... 19.25 20.35 22.30

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. V-5: 33-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.
 Ton lots 14.60¢
 Less ton lots ... 15.85¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. Si 56%, Ti 9%, Ca 5%.
 Ton lots 17.90¢
 Less ton lots ... 19.40¢

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.
 Eastern Central Western
 Ton lots 15.75 16.85 18.80
 Less ton lots ... 17.00 18.10 20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant
 Niagara Falls, Washington, Pa.
 York, Pa., per pound contained W, 5 ton lots, freight allowed.
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowed, per pound contained V.
 Openhearth
 Crucible
 High speed steel (Primos).....
 Vanadium pentoxide, 88-92% V₂O₅ contract basis, per pound Contained V₂O₅
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb
 Ton lots
 Less ton lots
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.
 Calcium molybdate, 45-50%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo.
 Molybdenum oxide in bags, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti
 Less ton lots
 High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 untag, per gross ton
 10 tons to less carload.....
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
 Carload lots
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy.
 Carload, bulk
 Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
 Carload
 Ton lots
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots
 Ton lots
Boron Agents
 Contract prices per pound of f.o.b. shipping point, freight allowed.
 Ferroboron, 17.50% min. B, 1.50% Si, 0.50% max. Al, 0.50% max. C.
 Eastern Central Western
 Ton lot \$1.20 \$1.21
Manganese—Boron 75.00% Mn, 1% B, 5% max. Fe, 1.50% max. Si, max. C.
 Ton lots \$1.89 \$1.903
 Less ton lots 2.01 2.023
Nickel—Boron 15-18% B, 1.00% max. Si, 0.50% max. C, max. Fe, balance Ni.
 Less ton lots...\$1.80 \$1.81
 Silcaz, contract basis, f.o.b. plant freight allowed, per pound.
 Carload lots
 Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.
 No. 1
 No. 6
 No. 79
 Bortam, f.o.b. Niagara Falls
 Ton lots, per pound.....
 Less ton lots, per pound.....
 Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.
 Ton lots, per pound.....
 Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B.....

Gulf, WHITCOMB DIESELS help process 200,000 Barrels of oil Daily



On a 'round-the-clock' schedule, two 70-ton Whitcomb Diesel Electric Locomotives handle 4,500 cars per month at Gulf's 3500-acre Port Arthur, Texas, refinery.

These recently delivered Whitcomb Diesel locomotives play a vital, profit-making role for Gulf, providing increased availability, greater economy, extra power needed to handle this refiner's greatly expanded operation. Replacing steam and gasoline power, these fast, trouble-free Whitcombs are at work on a 24-hour basis classifying, switching, hauling, spotting — delivering throughout the plant the materials for processing and maintenance, delivering tank cars to and from public carriers on a 3500-acre network of tracks.

Throughout industry — from oil to metal working to lumber to mining — leading firms are cutting their transportation costs with Whitcomb locomotives. Our long experience building locomotives for industry qualifies us to solve your haulage problems — large or small, simple or complex.

Remember, no power is cheaper than diesel power, and no locomotive is finer than a Whitcomb locomotive.

Locomotives spot deliver tank cars to plant points.

Whitcomb locomotives return "empties" from carrier tracks to refining plant.

Offering greater economy and availability, Whitcombs serve throughout industry.



THE
WHITCOMB
LOCOMOTIVE CO.

ROCHELLE, ILLINOIS

Subsidiary of

THE BALDWIN LOCOMOTIVE WORKS

(Continued from page 112)

Anaconda

MANGANESE NODULES



PRODUCTION of manganese nodules from the rhodochrosite ores of Butte's mines totalled 115,197 long tons in 1947, with an average manganese content of 59.62%. Anaconda's production is the principal U.S. source of supply for producers of ferro-manganese and other consumers of metallurgical grade ore.

Illustrated above is the 270-foot kiln at the Anaconda Reduction Works in which the manganese concentrates are sintered at a temperature of 2600° F.

48356



ANACONDA COPPER MINING COMPANY

Offices: 25 Broadway, New York 4, N. Y.

Anaconda, Montana

• **George D. Maves** has been named manager of the Boston branch of Minneapolis-Honeywell Regulator Co. and its industrial division. **Brown Instrument Co.**, having been promoted from mountain region manager of the company in Denver. **Edwin A. Thompson** has been promoted from the Peoria branch managership, succeeding Mr. Maves in Denver. **Robert H. Jacobs** has been appointed Peoria manager. Mr. Jacobs was formerly in the Milwaukee branch sales department. **Ray R. West** has been named manager of industrial sales. Mr. West who has been with the industrial division of Honeywell more than 10 years, has his headquarters in Philadelphia. **Lloyd E. Slater** has been appointed industry engineer of Brown Instrument and Minneapolis-Honeywell.

• **James I. Asnin** has been appointed assistant sales manager of Chas. Williams & Associates, New York. Previous to his new appointment, Mr. Asnin has been manager of the steel and machine department and was formerly associated with the Denver office of rolled products sales, Colorado Steel & Iron Corp.

• **Arthur L. Perkins** has been appointed eastern representative of Hammond Machine Builders, Kalamazoo, Mich.

• **Joseph P. Novak** has been named a packaging engineer at Reynolds Metals Co., Louisville. Mr. Novak was formerly associated with the Reynolds & Dauch Paper Co.

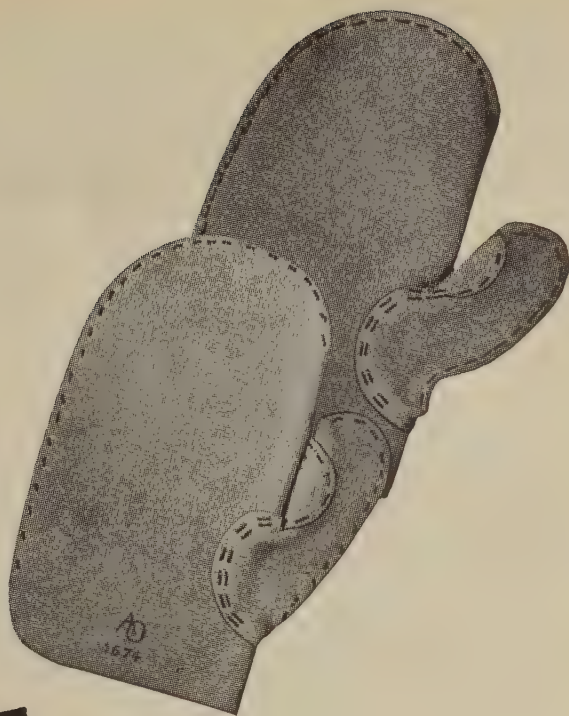
• **Earl C. Ward** has been appointed general manager of the newly organized parts and accessories division of Ford Motor Co., Dearborn. Ward has been formerly vice-president of Montgomery Ward & Co. **Alec L. Lobbestael** has been named plant superintendent of the Ford Ypsilanti plant.

• **Paul F. Steketee, Jr.** has been elected president of Keeler & Co., Grand Rapids. Mr. Steketee succeeds **Isaac S. Keeler** who has been made chairman of the board.

• **Leonard G. Zick** has been named secretary of C. M. Hall Lamp Co., Detroit, succeeding **George A. Hall**.

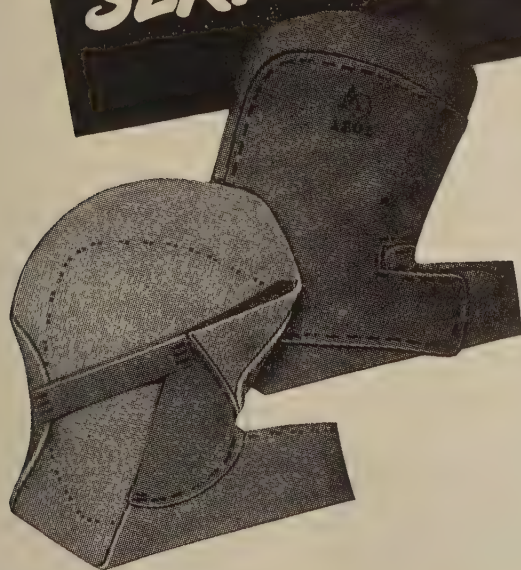
• **J. E. Cook** has been appointed Philadelphia district manager of Ampco Metal Inc., Milwaukee. **A. Burnett** has been named to succeed Mr. Cook in Cincinnati.

AO 5X138 GLOVE—Steel stapling includes (1) Index finger to crotch of thumb (2) Second, third and fourth fingers to palm (3) Thumb patch. All seams on face of glove steel sewed. 4 inch gauntlet.



AO 1674 MITTEN — There's DOUBLE the wear from this reversible mitten which may be worn on either hand. All seams steel sewed.

3 Handy Handfuls of Steel-Stapled **SERVICEABILITY**



AO 1201 HAND GUARD — In foundries, steel mills and where rough material is handled, this light, comfortable Hand Guard is a "natural." It can be put on and removed in a jiffy and when worn over light-weight gloves gives them added life. Open back, well protected thumb. Leather patch steel-stapled to palm provides added reinforcement.

The 5X138 Glove, 1674 Mitten and 1201 Hand Pad shown, are typical of the AO line of Steel-Stapled products for handling rough stock such as steel sheet, scrap, wheel castings, etc. Steel stapling at vulnerable places makes them almost as tough as the materials they handle. In design they offer everything possible for flexibility and comfort in durable chrome-tanned cowhide. Your nearest AO Safety Representative has these *proven-in-use* products.

American Optical
COMPANY

Safety

Division

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

THE IRON AGE, August 26, 1948—145

MATERIAL HANDLING

News



Trailer-loads of luggage, mail and express are hauled swiftly by the Clarkat to a waiting air liner.



On their way to storage a Clarkat hauls trailers loaded with castings, machined parts, drums and miscellaneous items.



Mass handling of palletized units on trailers is an easy, natural job for the Clarkat.

This compact package of pulling power "delivers the goods," at low cost The CLARKAT

Thorough, thoughtful analysis of performance records of towing tractors used in Industry leads you inevitably to the husky, nimble Clarkat.

Hauling huge tonnages of material by the trailer-train-load—using its squared nose to bulldoze heavy units into position—handling the numerous heavy-pull jobs common to most busy plants: the Clarkat has made an extraordinary record for efficient and economical performance wherever it has been put in service.

Only an experience like Clark's—30-odd years of resourcefulness in evolving modern materials handling methods and machines—could produce the Clarkat.

Exceedingly important is the exclusive and flexible center-pivoted suspension of the full-width steering axle—a guarantee of smooth, safe travel over rough surfaces. It's easy to handle, easy on the driver, easy to steer.

It is built in two models:

- Clarkat "20"—drawbar pull 2000 pounds, towing capacity 42 tons
- Clarkat "26"—drawbar pull 2600 pounds, towing capacity 58 tons

It is gas-powered, with either solid or pneumatic tires. For still heavier hauling the Clarktor "6" is recommended; built in four models with towing capacities of 47, 68, 90 and 104 tons respectively.

A knowledge of this husky, hustling worker rates high as vital business information. To explore how it will speed up your production with substantial savings, get the objective survey and recommendation of a Clark field representative.

It's always "good business" to CONSULT CLARK.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS



INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 51, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

PERSONALS

F. Taff has been appointed to Indianapolis district, succeeding Mr. Burnett, and Elmer E. White has been appointed to the Milwaukee office in Milwaukee.

• Michael Stumm has been named manager in charge of the advertising department Crucible Steel Co., New York.

• Roy D. Chapin, Jr., has been named special sales representative for the Hudson Motor Car Co., Detroit. Mr. Chapin joined the company in 1938.

• Robert L. Stubbs has been retained as Cecostamp consultant Chambersburg Engineering Chambersburg, Pa.

• A. H. Ross has resigned as president of A. H. Ross Co., Dayton, Ohio.

• A. C. Monteith has been elected vice-president in charge of engineering and research, Westinghouse Electric Corp., Pittsburgh, succeeding Marvin W. Smith. Monteith joined the company in 1923. In 1945 he took over the position of manager of headquarters and engineering department and director of education. H. C. McDaniel has been named manager of technical press service the public relations department Westinghouse Electric in Pittsburgh succeeding Carl E. McDaniel who has resigned to join McGraw-Hill Book Co., New York. Mr. Daniel joined the Westinghouse Lamp Div. in 1939 and in 1941 came associated with the technical press service in the Pittsburgh office.

• Thomas O'Hara, works manager has retired after 36 years with Symington-Gould Corp., Depew, N.Y. Daniel P. Murphy, vice-president in charge of operations assumed the additional duties of works manager.

• William C. Jordan has been elected vice-president and appointed general manager of Westinghouse Aeronautical Corp., Wood-Ridge, N.J., the engine building division of Curtiss-Wright Corporation. B. Focke has been appointed general manager of the Curtiss-Wright Airplane Div., succeeding Mr. J. H. Dan. Mr. Focke was formerly works manager of that division.

• M. B. Garber has been appointed general sales manager, The S. L. Co., Lorain, Ohio, succeeding



Underground River —THAT FLOWS UPHILL!

A river of coal flowing up from the depths of the earth—1,000 tons an hour moving smoothly on a giant conveyor belt! In modern *mechanized* mines like that pictured above, coal is pouring forth in this “streamlined” fashion—at a production rate for the entire U. S. never before equalled.

Yes, coal mining has come a long way since the “pick-and-shovel” days. In all progressive American mines, *machinery* helps the miner to do his job more easily, more safely, more efficiently. Machines enable the U. S. coal miner to produce far more tons per day than the coal miner of any other nation. In turn, the American coal mining industry pays its workers the highest average weekly wage of *any* major industry.

Mechanization, with all its benefits, has been the result of *foresight* and *faith*. Mine manage-

ment has had the *foresight* to install machines—and the *faith* in coal’s future to reinvest profits in every kind of mine improvement.

Yes, and in preparation for the still greater needs of tomorrow, the coal industry is planning more mechanization, new machinery, new mines, new preparation plants, which will call for expenditures totaling half a billion dollars during the next three years alone! The industry must rely mainly on earnings for financing this program—that it may serve America with ever-increasing efficiency.

BITUMINOUS  COAL

BITUMINOUS COAL INSTITUTE

A DEPARTMENT OF NATIONAL COAL ASSOCIATION

WASHINGTON, D. C.

BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS THE PROGRESS OF AMERICA

THE IRON AGE, August 26, 1948—147



Quality makes SOL-SPEEDI-DRI the leader

SOL-SPEEDI-DRI is industry's No. 1 absorbent for all liquids. Spread over dangerous, oil-soaked floors, it provides a slip-proof carpet—cuts down on accidents caused by slips and falls. More SOL-SPEEDI-DRI is used in plants and shops all over the country than any other product of similar nature. The reason? There are many, but the big one is *quality*—constant, unvarying quality from one pound of SOL-SPEEDI-DRI to the next.

SOL-SPEEDI-DRI is mined and processed by people who are specialists in the business. Only nature's finest product is used, and this raw material is processed under stringent laboratory control into the finished product. SOL-SPEEDI-DRI comes to you in special weather-proofed bags, insuring factory-fresh material at time of use. That's why you can count on SOL-SPEEDI-DRI to do *more* work, to give you *more* for your money.

WHEN YOU BUY, BE SURE IT'S SOL-SPEEDI-DRI!

Safety and Maintenance Co., Inc., No. 1 Wall St., New York 5, N.Y.

Warehouse Stocks Available in Principal Cities of the United States and Canada

FREE SAMPLE FILL OUT THE COUPON
AND MAIL TODAY FOR BIG, FREE SAMPLE

Name _____

Address _____

City _____ State _____

IA-8

SOL-SPEEDI-DRI
ABSORBENT FOR ALL LIQUIDS

PERSONALS

G. Savage who died recently. Garber has been assistant sales manager and export manager since 1937. Q. J. Winsor and J. T. Cushing have been named assistant general sales managers. Mr. Winsor previously held the position of assistant to the general sales manager and district sales manager for the East-Central territory with Mr. Cushing has been district sales manager for the West Coast.

- **Fred S. Bacon, Jr.** has been appointed assistant general sales manager of Rockbestos Products Corp., New Haven. Mr. Bacon formerly connected with the Westinghouse Electric Corp.

- **A. W. D. Black** has been appointed district sales manager for the Union Twist Drill Co., Attleboro, Mass., covering Rhode Island, eastern Massachusetts and Maine.

- **Charles C. Bush** has been named manager of the Cincinnati division of General Box Co., succeeding C. Marshall, who died recently. Bush has been associated with the company for 20 years.

- **Lawrence W. Early**, formerly district manager of the Los Angeles office of Hercules Powder Co.'s explosives Dept., has been transferred to the company's Salt Lake City office. **Robert W. Crabtree** has been appointed to succeed Mr. Early as resident manager of the Los Angeles office.

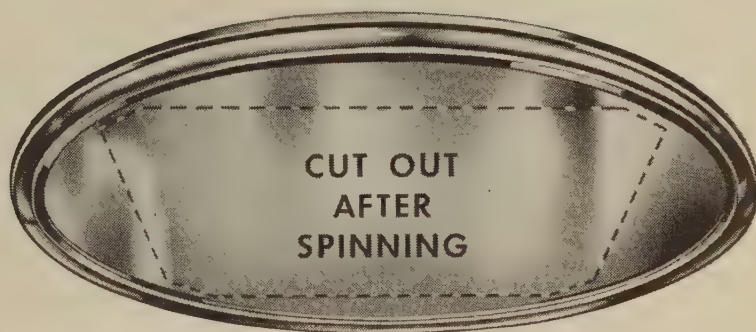
- **Duncan J. Morgan** has been named director of human relations for ATF, Inc., Elizabeth, N. J., succeeding B. F. McClancy. Mr. Morgan was formerly administrative assistant to the president of Illinois Tool Works.

- **A. W. Gilmore**, formerly manager of the wire and cable div., has been made manager of marketing of the newly-formed Construction Materials Dept., General Electric Bridgeport. **James H. Crawford**, manager of sales, has been named sales consultant. **Edmund J. Harrington**, manufacturing manager of GE Affiliated Manufacturing Companies Dept., New York, has been made manager of manufacturing of the new department and **Howard Black**, formerly works engineer for the company's Philadelphia plant has been named manager of engineering. **Theodore Foster**, formerly manager of the accessory equipment wiring device divisions has



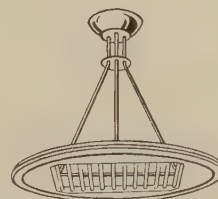
"TOPS" IN SPINNING

*an unusual
spinning job*



← 70" diam. →

The above illustrated spinning, for
fluorescent lighting fixtures, was spun
from one large piece of stainless steel.



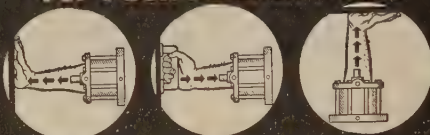
WRITE FOR DESCRIPTIVE CIRCULAR OF FACILITIES AND PRICES

Craft METAL SPINNING CO.
Division of Craft Manufacturing Co., Chicago
EAST DUNDEE, ILLINOIS

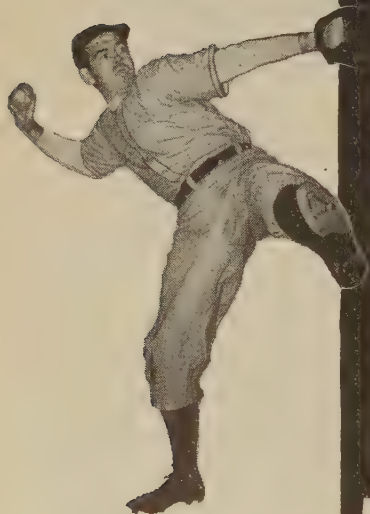
SPINNING
ANNEALING
POLISHING

PERFECT CONTROL

For PUSH-PULL-LIFT Jobs



with **T-J**
CYLINDERS



SAVE LABOR!

SPEED PRODUCTION!



More than a "muscle saver"—T-J Air and Hydraulic Cylinders give you *accurate automatic control* for operations of all kinds where pushing, pulling or lifting is needed. Depend on T-J Cylinders to simplify machines ... save time and labor ... and do the job *right* at all times. Available in many standard sizes and styles... 100 lb. or 50,000 lb. ... both cushioned and non-cushioned types. Precision-built with rugged dependability ... backed by 31 years of know how. Write today for catalogs. The Tomkins-Johnson Co., Jackson, Mich.

FOR TOUGH JOBS SPECIFY

T-J

TOMKINS-JOHNSON

RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

PERSONALS

made responsible for the access equipment division and **Joseph Lengyel**, formerly manager of sales of the tungar and metallic rectifier division, has been made head of the wiring device division.

- **K. F. Houseman** has been appointed plant manager, **Claude Auger**, engineer and **Paul Nichols** production manager, for operation of the General Electric Co.'s new aircraft jet assembly test plant at Lockland, Ohio.

- **Francis B. Harper** has been appointed superintendent of the 10 and 12-in. bar mills of the Bethlehem Steel Co., Lackawanna, N. Y. Mr. Harper has been with the company more than 15 years.

- **Maurice Henchey** has been appointed assistant regional sales manager for Willys-Overland Motors, Toledo. Mr. Henchey was formerly regional manager for Kaiser-Fraser Corp.

- **Richard E. Predmore** has been made manager of customer engineering for the electric typewriter division, International Business Machines Corp., New York. Predmore joined IBM in 1940. Previous to his new appointment was customer engineering supervisor in St. Louis.

- **John Crampton** has been appointed representative for Detroit Broach Co., Detroit. Mr. Crampton is located in Cleveland.

- **John E. Fasano** has been made sales manager of the newly-created Spirolox retaining ring division of the Ramsey Corp., St. Louis. Fasano was formerly associated with Waldes Kohinoor Inc.

- **Lloyd H. Bender** has been appointed assistant sales manager for the Swift 125 airplane of Teledyne Engineering & Mfg. Co., Dallas. **Leonard Larson** has resigned from that company.

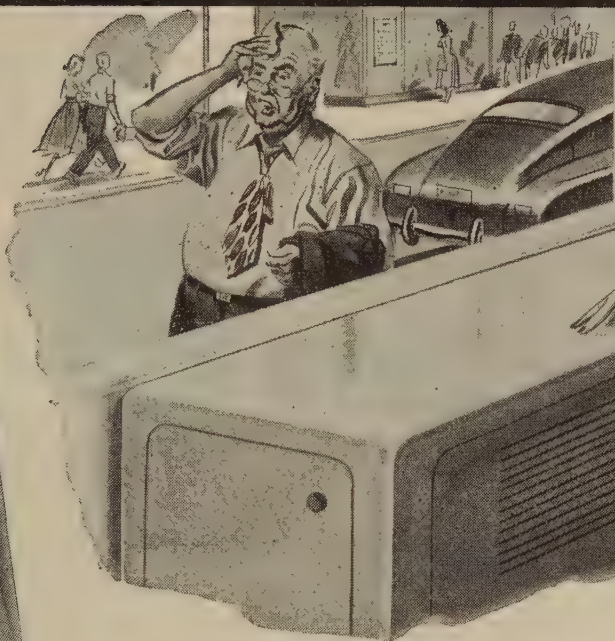
- **F. L. Burke** and **Edward R. Godfrey** have been appointed directors of General Motors Corp., Detroit, and members of the operating policy committee. Mr. Burke is vice-president in charge of the accessory group and Mr. Godfrey is vice-president in charge of Dayton and Household Appliances divisions.

- **J. M. Graham, Jr.** has been appointed assistant director of Monsanto Chemical Co.'s general engineering department. Mr. Graham

GET COSTS DOWN

"Out of the Air"

and put a fresh breeze behind sales...



... the way Air Conditioners do it
with **AMERICAN PHILLIPS SCREWS**

DEFLATE COSTS . . . like one of the largest refrigerator and air conditioner manufacturers . . . who says: "Our present high production would not have been possible without American Phillips Screws . . . *which permitted the efficient use of power drivers.*" And which *did not permit* any more driver skids, spoiled work, dropped screws, burred screw heads, slashed hands. Now, labor costs keep in line, as do material costs. And time savings run as much as 50%.

INFLATE SALES with the modern, inviting look of American Phillips Screws. The clean-edged, tapered recess flashes the message of quality *instantly* to the buyer's eye. And remember, too, that in any motorized merchandise, the special vibration-resistance of American Phillips Screws has a lot to do with *keeping customers sold.* Let American engineers translate these Phillips advantages in specific terms of your own product. Write.

AMERICAN SCREW COMPANY, PROVIDENCE 1, RHODE ISLAND

Chicago 11: 589 E. Illinois St.

Detroit 2: 502 Stephenson Building

4-WINGED DRIVER CAN'T SLIP OUT
OF PHILLIPS TAPERED RECESS



**AMERICAN
PHILLIPS** *Screws*



ALL TYPES
ALL METALS: Steel,
Brass, Bronze, Stain-
less Steel, Aluminum,
Monel, Everdur (sili-
con bronze)

CARLTON SUPPLIES:
RUTHMAN
GUSHER
COOLANT PUMPS
as standard equipment on
their radial drills.

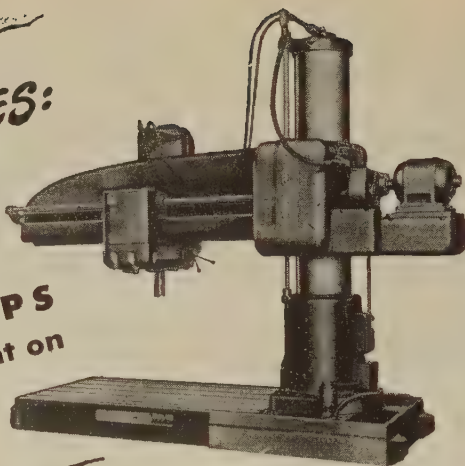


Photo Courtesy
The Carlton Machine Tool Company
Cincinnati, Ohio

Yes, more and more of the leading machine tool manufacturers all over the country supply Ruthman Gusher Coolant Pumps as standard equipment on their machines. They have learned from experience that Ruthman Pumps give their customers long service, low maintenance costs and efficient operation at all times.

So follow the leaders in the industry, specify Ruthman Gusher Coolant Pumps on your metal-cutting machinery.

Illustrated above is a Carlton Radial Drill equipped with a Model UL Immersed type Gusher Coolant Pump.



THE RUTHMAN MACHINERY CO.

1821 Reading Road

Cincinnati 2, Ohio

PERSONALS—

has been serving as manager of the department's process section. He will continue to direct that section. He joined Monsanto in 1934 as an operating trainee with the Swann Chemical Co.

• **Allen W. Morton** has resigned as vice-president and general manager of the Piston Ring Div. of Ford Motor Co. Inc., Pittsburgh. Mr. Morton will remain as consultant to the new Metal Products Div., a consolidation of the Shops Div. and the Piston Ring Div., the manufacturing activities of which continue in Baltimore.

• **A. M. Fleming** has been appointed vice-president in charge of manufacturing of the Chrysler Division of Chrysler Corp., Detroit. **F. J. Wunderlich** has been named to succeed Mr. Fleming as general manager of that division. **Franke** has been appointed chief engineering manager of the Dodge Division. **M. C. Patterson** has been named general works manager.

• **Perry R. Barker** has been chief designer of the power plant department of the Standard division of Yale & Towne Mfg. Co. Mr. Barker has had some 15 years of service in that department.

OBITUARIES

• **Herbert C. Greer**, 71, president of Greer Steel Co., Dover, Ohio, died Aug. 5.

• **Fred S. Fuld**, 69, former
dent, Harry Benjamin Equ
Co., St. Louis, died Aug. 6.

• **Walter F. Piper**, 63, retired president and treasurer, Be & Piper Co., Chicago, died A

• **J. Garrison Stout, 57,** chief of the standards department of Bradner Co., Cleveland, died

• **William H. Jones, 64**, foreman at the T.C.I. Ensley roll shop and a 45 years a U.S. Steel employee recently.

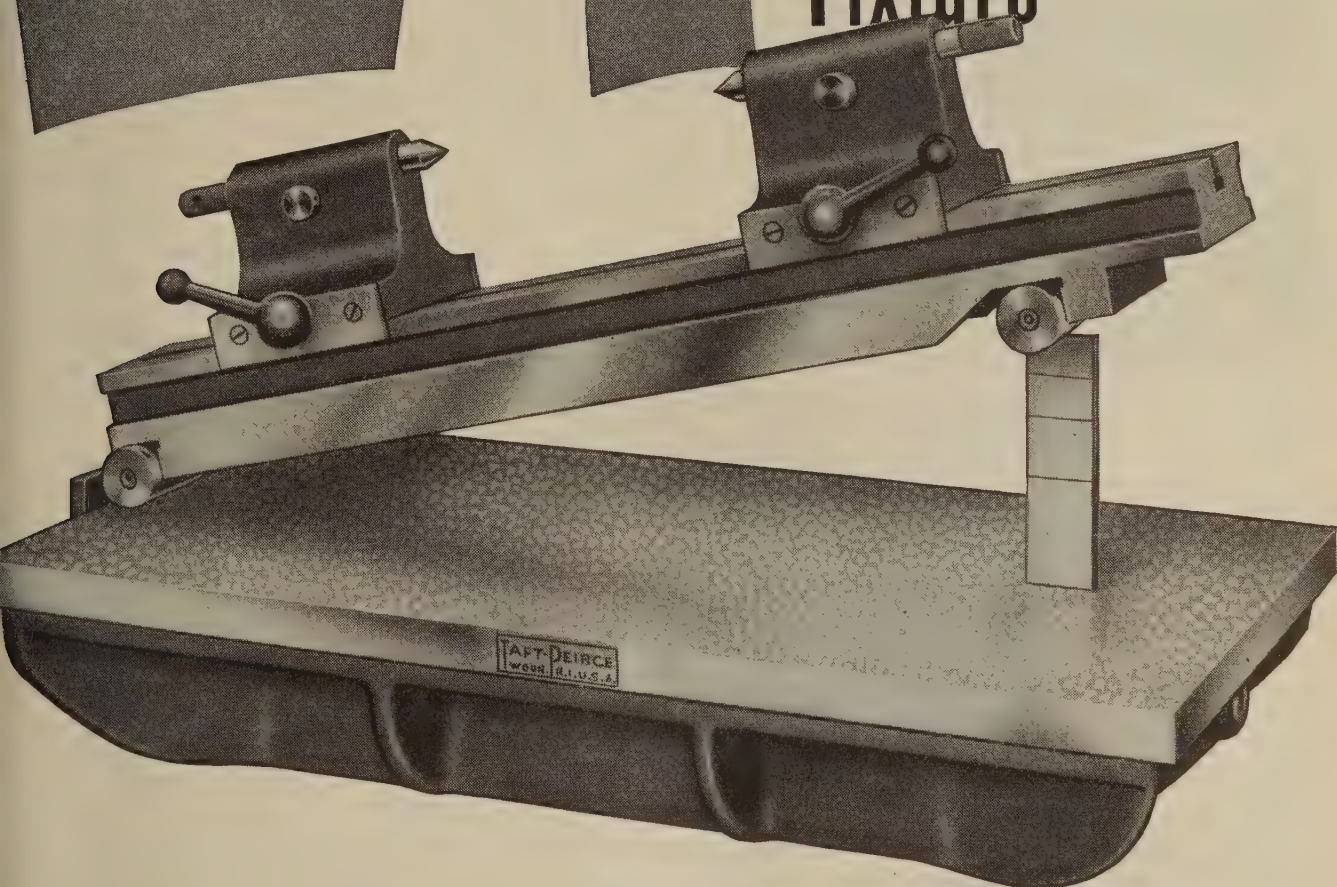
• **James P. Dovel**, 79, con-
engineer and former vice-pr-
of Sloss-Sheffield Steel & Ir-
Birmingham, died recently.

• **Robert L. Cleland, Sr.**, 71, formerly eastern district manager of East Clay Products Co., died

• **Morrill Dunn** of the **Dunn** Corp., Detroit, died Aug. 7.

• **William H. Riddell, 53**, president of Riddell Engineering Company, Birmingham, died Aug. 12.

21 in Taft-Peirce Sine Block Taper Testing Fixture



...for Precision Checking of Tapers and Angles

Taper Testing Fixture mounted on Taft-Peirce Precision Surface Plate Style 9211

There's a versatile Taft-Peirce fixture which will do a double job in any toolroom. First it enables you to check tapers up to 15" long and 6" in diameter with an unusually high degree of accuracy. Also, when center heads are removed, it gives you an extra-long (20") sine bar for extremely precise angle checking. Made to top-precision standards, this sine block fixture ensures top-precision in inspection. The sine block is made of an alloy steel, hardened, treated to insure

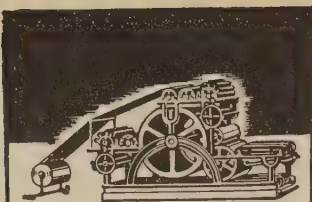
stability, and precision ground. The sine plugs are identical in diameter and are accurately spaced twenty inches from center to center; the centers are lapped to a close fit and are in perfect alignment.

For additional information about this unusual Taft-Peirce fixture, and the many other top-precision Taft-Peirce Toolroom Specialties write today for the Taft-Peirce Handbook.

THE TAFT-PEIRCE MFG. CO., WOONSOCKET, RHODE ISLAND



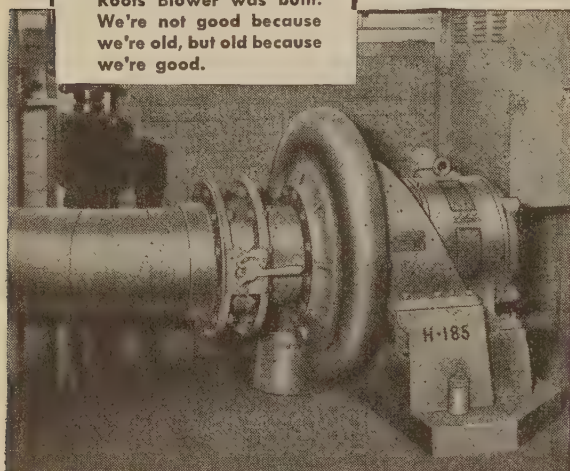
T-P means TOP PRECISION



In 1865, William Bullock built the first press which printed from a continuous web or roll. Eleven years earlier, in 1854, the first Roots Blower was built. We're not good because we're old, but old because we're good.

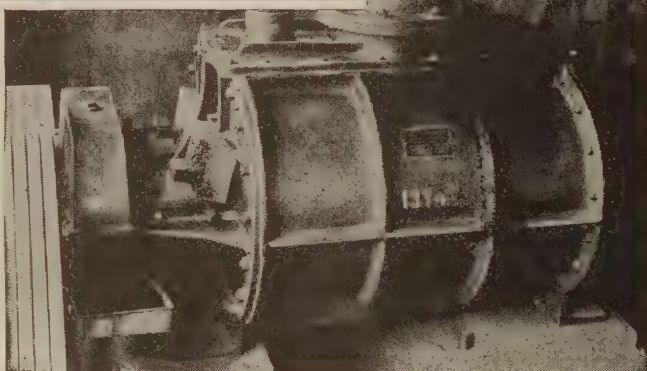
Exclusive Service...

R-C dual-ability



R-C Centrifugal Blower, motor-driven, in foundry cupola service. Capacity 4,400 CFM.

R-C Rotary Positive Blower, for cupola service. Capacity 4,000 CFM at 16-oz. pressure.



You obtain an important, exclusive advantage when you consult us about problems of moving air or gas. That is, our *dual-ability* to supply either Centrifugal or Rotary Positive units.

This *dual choice* allows you to match equipment exactly to your needs, in capacities, pressures and other characteristics. You can have standard Rotary Positive units from 5 CFM up, or Centrifugal units to meet your top requirements. You save time, trouble and money.

So, utilize this exclusive *dual-ability* by consulting us on your requirements. The economy and dependability of R-C Blowers have been proved for almost a century.

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NEWS OF INDUSTRY

Council Appointed for Experimental Study of Concrete Reinforcement

New York

... Creation of a council to carry out studies and experimental research in reinforced concrete under sponsorship of the Engineering Foundation, New York, and to interpret the results in the form of a code for the design of concrete structures, was announced here. Dr. A. B. Kinzel, chairman of the foundation's board. It is anticipated that such a code may permit the use of reinforced concrete in longer span structures than considered possible and should eliminate much of the uncertainty in design.

The research will be undertaken with approval of The American Society of Civil Engineers, one of 4 engineering societies that established the foundation. It is 1 new projects receiving support from the foundation this year.

In working with concrete, Kinzel pointed out, the engineer dealing with a material in which deformation is not proportional to the stress. In the past, concrete and steel have been combined in the design was based on the incorrect assumption that the strain in the concrete is, as in steel, proportional to the stress.

The council on research in reinforced concrete is composed of authorities in the field and representatives from interested organizations. They are: Robert Blawie, director of research, bureau of investigation, Denver, chairman; Jewell M. Garrelts, Columbia University, secretary; Prof. Clyde Morris, Ohio State University; Frank E. Richart, University of Illinois; F. R. Smith, chairman of the committee on masonry, American Railway Engineering Association; Raymond Archibald, chairman of the bridge specification committee, American Assn. of State Highway Officials; Albert E. Cummings, research engineer, Raymond Concrete Pile Co.; Arthur J. Boase, Portland Cement Assn.; and Harold D. Jones, chairman, engineering practice committee, Reinforcing Steel Institute.

The committee on masonry reinforced concrete, of the American Society of Civil Engineers,

...n studying reinforced concrete several years, Dr. Kinzel examined. This committee concluded that carefully planned laboratory tests are necessary as a guide to further study and recommended to the Engineering Foundation that the entire theory of reinforced concrete be studied critically with a view to evolving a workable scientific theory for the design of concrete structures.

Until recently the methods used in the design of reinforced concrete were essentially empirical," Kinzel continued. "On the basis of results obtained from an extensive set of tests conducted by the University of Illinois and Lehigh University, rational procedures have been established for the design of eccentrically loaded reinforced concrete columns. These tests demonstrated the inadequacy of the old theory.

Two investigations have been recommended by the A.S.C.E. committee for immediate consideration by the council.

The first is to be carried on at Ohio State University. Its purpose is to determine the shape of the stress block in reinforced concrete under the compression zone by means of photoelastic methods. This proposed study is a continuation of previous tests which have already been made at the university.

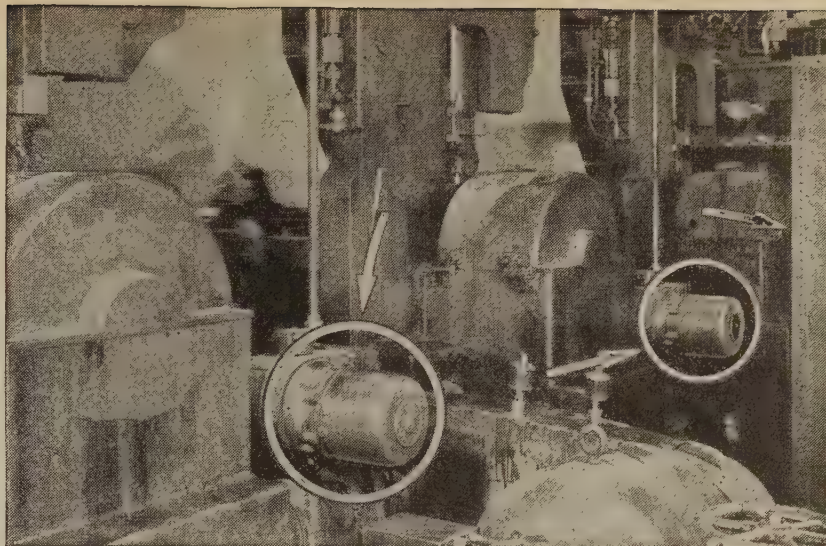
The second investigation is to be conducted by Professor Richart and associates at the University of Illinois. It will be concerned with reinforced concrete members subjected to combined bending and direct stress. It is proposed to build and test 126 eccentrically loaded specimens with varying eccentricity ratios, varying percentages of steel, and for three different strengths of concrete.

Propose 3 for 1 Split Of Keystone S & W Stock

...oria, Ill.

• • Directors of the Keystone Steel & Wire Co. have approved a proposal to submit to the stockholders a plan to increase the company's outstanding capital stock from 625,000 shares to 1,875,000 shares by issuing 2 additional shares for each share now held.

"If the stockholders approve of the split," Reuben E. Sommer, president of the company, said "the



Stearns MAGNETIC BRAKES for Printing PRESSES

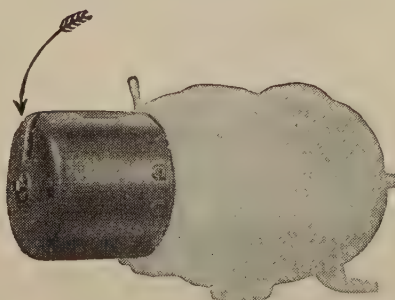
"We have never had one of them out since installed so that the maintenance has been practically nil," writes Gen. Sup. Alger of the successful Neo Gravure printing firm.

He uses Stearns Magnetic Brakes with the impression lifting drive on his huge presses.

Just one of many profitable applications for Stearns Magnetic Brakes.

Perhaps we can help you. Tell us about your problem.

Ask for Bulletin 604.



The magnetic brake with the lining wear indicator and manual release—distinctive, original.

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THE BUFFALO WIRE CLOTH MAN!

My wardrobe is the most complete you've ever seen. I'm ready for any occasion, to withstand everything from ordinary wear to rust, corrosion and excessive heat.

TODAY I'M GALVANIZED AFTER WOVEN

COATED? EVERY BIT OF ME!

Know why? I'm hot dipt. But first I'm cleaned. Then, mind you, I'm pickled. Just try and work my coating loose!



AM I SMOOTH? AM I BRIGHT?

I'll say I am! I've just the right amount of zinc. Not too much. That would cause "points". Not too little. That would cause "pitting". Brother, I'm Controlled.



TAKE A LOOK AT MY NODES!

Ever see anything like them? Course not! They're sealed closed. Why, my joints are so smooth that one week I'm a tobacco apron and the next I'm a rayon conveyor.



LIKE MY SHAPE?

True and flat, isn't it? Stays that way, too! You don't see me buckling when I'm rolled out. Cut me into small pieces if you like. I'll still be square and rigid.

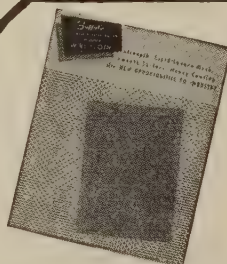


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456 TERRACE

BUFFALO 2, N. Y.

management will recommend the board that the company pl the new shares on a regular annual dividend rate, payable quarterly."

The company's stock is current on a regular \$2 basis, but during past fiscal year extra dividends totaling \$1 were paid.

Mr. Sommer added that it will continue to be the management policy to recommend such additional payments on the new shares from time to time as the earnings justify.

Principal Radioactive Materials Available In Ample Quantities

Evanston, Ill.

• • • Scientists can now obtain the principal radioactive materials in whatever amounts they are needed for research and radiotherapy, two chemists of the Atomic Energy Commission's Isotopes Division, Oak Ridge, Tenn., reported recently at the final session of the American Chemical Society's symposium on nucleonics and analytical chemistry at Northwestern University.

This situation has been made possible by a rapid increase in the output of the most useful isotopes according to a paper by the division chief, Dr. Nathan H. Woodruff, and Dr. S. Allan Lough, who noted that when production of isotopes for research was initiated after the war, supplies were scanty and distribution was limited to those institutions carrying out work of prime importance.

"Due to the excellent progress in the production of radioisotopes made by the commission-sponsored laboratories, especially the Oak Ridge National Laboratory, it is no longer necessary to assign priorities to any application of a requester qualified to handle the radiomaterials," the chemists declared.

"The supplies of routinely produced materials are adequate to satisfy the demands. Consequently the necessity of evaluating the significance of a proposed investigation has been removed.

"It is granted that there are a few radioisotopes now listed in the catalogue on which development work has been slow due to several difficulties encountered and

present lack of trained manpower and to inadequate facilities." Radioactive materials are still handled primarily through institutions, private or public, profit or non-profit, the report said. The definition of an applicant has been expanded, however, to include "any institution or person who is in a position to accept legal responsibilities and financial obligations, and is adequately equipped to handle radioactive material."

The Atomic Energy Act requires that the commission be informed of the proposed use of the isotopes, the paper stated, and although some applicants are hesitant about giving this information for fear of disclosing forthcoming developments anticipated by commercial organizations, the commission does not release any information without full permission.

In addition to the common isotopes, the commission has made available ultrapotent preparations for special use, the paper continued, and scientists requiring unusual isotopes can have them made at the atomic pile if they furnish their own raw materials.

Other speakers at today's sessions, and their topics, were: Dr. N. Hume of the Massachusetts Institute of Technology, "Activity Analysis"; Dr. G. E. Boyd of Oak Ridge, "Activation Analysis", and J. W. Irvine, Jr., "Industrial Applications".

The symposium, sponsored jointly by the society's division of analytical and micro chemistry and Analytical Chemistry, a monthly publication of the society, inaugurated an annual series.

Iron Society to Hold Their Annual Meeting

Cleveland

• The 20th annual meeting convention of the Gray Iron Founders' Society, will be staged at Hadden Hall, Atlantic City, Oct. 5, 1948.

Principal speakers at the noon luncheon are William B. Given, president, American Brake Shoe Co., New York City, and Col. Harlan Hoffman, former governor of New Jersey. Mr. Given will speak "Rating Better People in our Industries."

Participating in a symposium on Laundry Hygiene on Thursday afternoon, Oct. 14, will be A. E.

IS HANDLING CUTTING DOWN YOUR PROFITS?



* M H is Mass Handling—the systematic movement of the most units, in the shortest time, at the lowest cost.

When excessive production costs and restricted productive output combine to cut down profits, better check your handling methods—and replace with Towmotor Mass Handling. Towmotor Fork Lift Trucks and Tractors, gasoline-powered for full-time, full-power service, provide maximum handling efficiency in any plant, large or small. You'll invest less and get more from Towmotor—always ready to lift, transport and stack materials and products of any kind . . . anywhere, any time. Operating costs? Let the men who have to make handling pay a profit show you: More professional handlers use Towmotor than any other fork lift truck.

You can double and triple savings on your handling operations with Towmotor Accessories, such as the Unloader illustrated. If you cannot solve your handling problem with standard Towmotor Accessories, Towmotor engineers will help you work out special equipment to meet your specific needs. Write for details.



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THE ONE-MAN-BANG

**FORK LIFT TRUCKS
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McDANEL Combustion Tubes

**High Temperature
Porcelain**

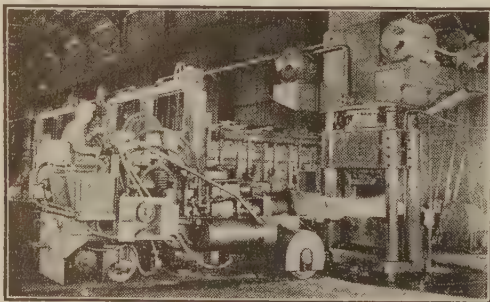
McDanel Tubes are precision made. Every stage of production is laboratory controlled, thus guaranteeing proper density, accurate bore size and thickness. Only perfect tubes are permitted to leave our plant. That's why McDanel Tubes stand up in service. Now preferred and used by leading metallurgical laboratories from coast to coast for carbon and sulphur determination in Iron and Steel analysis. Made in straight, tapered and double reduced, self-cooling ends.

Specify McDanel High Temperature Combustion Tubes from your supplier.

McDanel Combustion Tubes are cast as one integral unit. Above illustration shows tube being removed from the mold.

McDanel Refractory Porcelain Co.
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Do it Faster Safer Better with Brosius Manipulators and Chargers



Hot, back-breaking and dangerous handling jobs at your furnaces, presses and hammers, are a breeze with Brosius Manipulators and Chargers. Built in capacities ranging from 2,000 to 20,000 pounds, these Manipulators are self-contained, hence require no tracks or expensive runways.

Chargers are designed as tong machines to handle billets, slabs, blooms, ingots, etc., or to handle a charging box for serving melting furnaces. Because they turn on their own wheelbase, they are particularly adapted for operations in limited or confined areas.

Brosius Manipulators are especially designed for manipulating forging blanks under hammers and presses, and the charging and drawing of heating furnaces. Like the Chargers, they are equipped with anti-friction bearings, rubber tires and hydraulic steering. Fatiguing effort is eliminated for the operator.

Edgar E. BROSIUS Company Inc.

Designers & Manufacturers of Special Equipment for Blast Furnaces & Steel Mills
SHARPSBURG, Pittsburgh (15) PENNSYLVANIA

NEWS OF INDUSTRY

Hamlin, Medical Director, American Brake Shoe Co., Chicago; Theodore F. Hatch, Research Director, Industrial Hygiene Foundation of America, Inc., Pittsburgh, and Theodore C. Waters, partner, Mullikin, Stonebridge and Waters, Baltimore.

Other speakers on the program are Dr. Robert S. Hartman, executive secretary, Council of Primary Sharing Industries, Wooster, Ohio; H. C. Nickolas, president, The Quality Castings Co., Orville, O.; J. A. Claussen, secretary, Merchant Pig Iron Committee, American Iron & Steel Institute, New York City; and James H. Smith, general manager, Central Foundry Division, General Motors Corp., Saginaw, Mich.

Howard A. Stockwell, Barre, Vt., Stockwell Co., Cambridge, Mass., president of the society, will preside at all sessions.

Capehart Subcommittee Probes Trade Policies Starting September

Washington

• • • The Capehart subcommittee investigating trade policies, including effects of f.o.b. pricing, has set September 15 as the date for its first meeting of its recently appointed Advisory Council.

Senator Capehart will then convene the Council—composed of representatives of industry, agriculture, labor and consumers—to make surveys of the impact of pricing policies and to report to his group later than mid-November.

At that time, the subcommittee staff expects to have completed preliminary investigations and be ready to call full-scale public hearings. Early hearings will be devoted largely to the pricing problem as a result of the cement decision.

"This ruling prohibits absorption of freight costs by producers," Senator Capehart said. "While the decision applies only to cement, it can be applied to every industry in the United States which is affected by freight costs."

"The ultimate question to be decided," he added, "is whether producers should be permitted to charge their products throughout the nation at a uniform delivered price or, absorb freight or any

hereof in order to compete with competitors whose plants are located nearer the customer."

The Council will be requested to allow two lines in making its survey. One is to check and report on the effect of such pricing policies on the specific field represented. The other is to make the same check from a standpoint of the effect on the community (or customer).

Admiral Ben Moreell of Jones & Laughlin Steel Co., Charles R. Tyn of John A. Robeling Sons Co., and Philip Murray, head of the United Steel Workers, were included among the Council members.

Other members of the committee are James H. Ackerman, Lawrence Portland Cement Co.; John C. Owen, Lehigh-Portland Cement Co.; James Brownlee, retired food processing executive; Edward W. Carter, Broadway Department Stores, Inc.; Walter L. Couse, Walter L. Couse & Co.; Cris Dobbins, Lehigh Portland Cement Co.; Paul V. Doolen, E. Staley Mfg. Co.; David Edwards, Saco-Lowell Shops; Nathaniel B. Engle, University of Washington; Charles W. Evert, Downing Box Co.

William Fette, Jr., Schutter Candy Co.; Alexander Foster, Jr., Warner Co.; A. P. Green, A. P. Green Fire Brick Co.; Albert Goss, National Grange; Albert Haring, University of Indiana; Herschel A. Pollopeter, Indiana State Chamber of Commerce; William L. Hutcheon, United Brotherhood of Carpenters & Joiners of America; Roy Ingersoll, Ingersoll Steel and Tank Division of Borg-Warner Corp.; Frank A. Kemp, Great Western Sugar Co.; Julius Klein, American Security & Trust Co.

Allen Kline, American Farm Bureau Federation; Leverett Lyon, Chicago Association of Commerce and Industry; Fred Maytag, Maytag Co.; James R. McCarthy, Notre Dame University; L. A. McQueen, General Tire & Rubber Co.; Donald Mitchell, Sylvania Electric Products, Inc.; James D. Mooney, Willys-overland Co.; James O. Patton, National Farmers Union.

Henning W. Prentiss, Armstrong Cork Co.; William M. Rand, Monsanto Chemical Co.; N. D. Ruhm, Bates Manufacturing Co.; William Schoenberg, United Cement, Lime & Gypsum Workers International Union; Joseph H. Sheppard, Illinois Central Railroad; Alfred



To eliminate waste and scrap

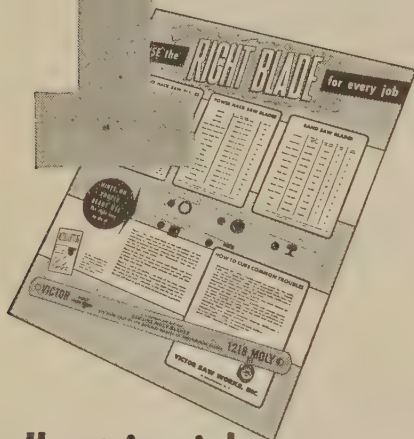
NORTHERN OVERHEAD ELECTRIC CRANES

Measure and lay out accurately—pick it up with a **NORTHERN OVERHEAD ELECTRIC CRANE** and move it quickly and safely to the shear—cut off just what's needed, no more, no less—rush it to where it's needed for processing! That's the most dependable formula today for eliminating hard-to-replace, high cost waste, scrap and production delays.

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With this new Victor Wall Chart near the tool crib or in your machine shop, it takes only one look to find the one blade that's best for the given job. And, once you use it, all jobs can be performed much faster, with fewer rejects and broken blades.

Besides showing you how to match blades to materials, this attractively printed, 17 x 22 inch Victor Wall Chart gives you valuable information on the care and use of the blades themselves—tips that are very valuable in cutting blade costs.

It's all yours, too, absolutely FREE. Simply write on your letterhead to your Victor supplier or to the address below. *The supply is limited.*

This is but one of the many helps offered by Victor supplier. He is the right man to see for the right blade. He has the complete Victor line—a blade for every job a hack saw or a band saw can do. No matter what you cut in the way of metals, plastics, or other non-metallics—there's a Victor blade to cut it faster, cleaner, and last longer. See your Victor supplier for the best blades.

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Makers of Hand and Power Hack Saw Blades, Frames and Band Saw Blades.

NEWS OF INDUSTRY

Southon, Kalamazoo Vegetable Parchment Co.; Cloud Wampler, Carrier Corp.; S. Clay Williams, R. J. Reynolds Tobacco Co.; Ivan M. Bridges, C. E. Erickson Co.

S.A. Countries Prefer U.S. Capital, Markets

Buenos Aires, Argentina

• • • Many a sound business opportunity is now open in South America.

Attractive import possibilities are being uncovered daily, according to a survey by the New Orleans Board of Port Commissioners made jointly with the International House and the recently opened International Trade Mart.

These countries are facing the so-called "dollar crisis" and are doing everything to invite foreign investment by intensifying production, and seeking to develop markets abroad.

Without exception every South American republic prefers U. S. capital, U. S. markets and U. S. equipment and machinery.

"If we meet them half-way," the report continues, "their markets will be open to our exports and two-way trade will be assured with its stabilizing influence on U. S. industrial planning for full employment. If not, these South American leaders will seek the solution elsewhere."

President Juan Peron of Argentina, speaking recently to representatives of the Argentine Chamber of Commerce, said the country's lack of dollar exchange was the result of reluctance on the part of the U. S. to buy Argentine products.

"We are doing our best to work with the U. S.," said Person, "we prefer to deal with the U. S., but if we are forced to do so, we shall sell to Russia."

Leaders of other South American countries voice the same feelings. Each has some product he would like to find a market for in the U. S. and each hopes that eventually that goal will be realized.

German Practice Like Ours

Washington

• • • German practice in the manufacture of high frequency iron cores for electronic equipment in general parallels American practice, according to a report on sale

WAREHOUSE STOCKS OF

ALLOY BARS

ROUNDS
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Hot Rolled.
½" to 10" Rd.

Cold Drawn.
⅛" to 4½" Rd.
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AIRCRAFT

AMS—6260
6270
6272
6280
6322
6324
6415
6320 Hex.

BESSEMER

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CARBON

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FORGINGS

WRITE FOR
OUR MONTHLY
STOCK LIST

HY-ALLOY STEELS CO.

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RAN 5253

The Office of Technical Information, Dept. of Commerce.

The report was prepared by Enze R. Hensel, vice-president in charge of engineering, P. R. Mallory Inc., Indianapolis, following an investigation of 8 German firms under OTS sponsorship.

A short description of the practices of the 3 leading German firms that were responsible for most of the production and important development work in the field is given in the report.

The other 5 producers visited had developed any special methods or unusual practices, the author writes.

San Gets \$2.5 Million Army Air Force Contract

San Diego

• The Ryan Aeronautical Co. has been awarded a contract for 158 Ryan Avion 4-place planes by the Army Air Forces, according to T. J. Ryan, president of the company.

In addition to the 158 planes, designated as L-17B's, Ryan's new \$2.5 million contract calls for components and spares which in dollar value are equivalent to another 60 complete Navions.

Deliveries of these planes will begin within the next 2 months and continue until about the first of next year.

Approximately one third of the planes are scheduled for use by the Army field forces for distribution along a number of different bases. Somewhat more than a third will be used at occupation bases abroad, with one half going to Europe and the other half to Asia.

The remaining planes are to go to National Guard bases.

Prepares Exposition Plans

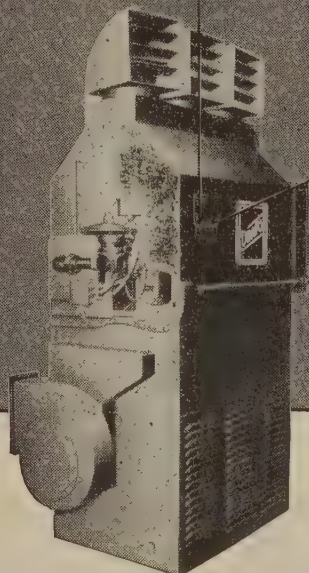
New York

• Equipment designed for new economies in the production, regulation and transmission of power will be exhibited at the eighteenth annual National Exposition of Electrical and Mechanical Engineering from Nov. 29 to Dec. 4.

Although the production of modern equipment is high and a large backlog of orders are on hand, the company of this year's exposition will be devoted to stepping up existing plants and more especially to cut

LISTED—

APPROVED



NOW—two famous laboratories have tested the Dravo Counterflo Heater and found it to be constructed in accordance with their standards. Effective immediately all standard gas-fired Dravo Counterflo Heaters will bear the American Gas Association and Underwriters' Laboratories, Inc., marker indicating approval and listing, respectively. In addition all standard oil fired Dravo Counterflo Heaters are listed by Underwriters' Laboratories, Inc.

For additional information regarding sizes, efficiencies, specifications, etc., write Dravo Corporation, Heating Section, Dravo Building, Pittsburgh 22, Pa. Ask for bulletin HG516.



Dravo also manufactures the DRAVO CRANE CAB COOLER for air conditioning hot-metal crane cabs

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Predictable Castings Produced for Machining

It's surprising to learn how many manufacturers are looking for sound, accurate, predictable ferrous castings. Everywhere we go to talk about *Strenes Metal* cast dies, we are asked if we do the same quality of work in alloy gray iron and gray iron. When we answer yes, we are given a lot of jobs for machine beds, bases, columns, and other items which require good castings; and our customers keep coming back for more.

As everyone knows, it pays to go far, if necessary, to get close-grained castings free of porosity, cold shuts, blowholes, inclusions, and other defects revealed by machining. The extra transportation cost is insignificant compared to the reduction of tooling expense and avoidance of scrap.

If you have been unsuccessful in getting predictable castings for machining, communicate with us.

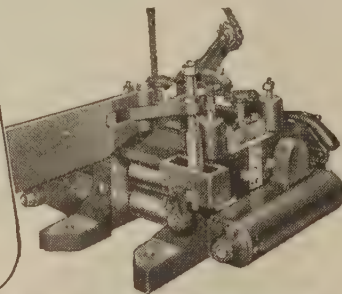
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THE ADVANCE FOUNDRY CO., 103 Seminary Ave., Dayton, Ohio

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ALLOY GRAY IRON
GRAY IRON

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Feeding of
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For All Types of Punch Presses

Wittek *Automatic* Roll Feeds provide maximum efficiency in the high speed automatic feeding of all types of coiled strip stock to punch presses. Highly flexible in function and application, they are capable of feeding lengths up to 24" per stroke of the press and will handle various stock thicknesses in widths up to the maximum width of the rollers.

Wittek *Adjustable* Reel Stands provide automatically expanding coil holders that center the coil and assure maximum production by eliminating looping, tangling and back lash of stock. If your production problem involves feeding coiled stock to punch presses, consult us. Your inquiry will be given immediate attention. Ask for completely descriptive catalog.

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ROLL FEEDS
and
REEL STANDS



power costs wherever leaks are plugged or higher efficiencies introduced.

Exhibits already enrolled and preparation range over the field, and in a wide assortment from the fire-box to the push-ton on the last motorized unit the plant.

Dr. Mehl Is Made Head Of Research Committee

Pittsburgh

• • • Dr. Robert F. Mehl, Director of the Metals Research Laboratory of Carnegie Institute of Technology, has been named chairman of the committee on ship steel of the National Research Council.

This committee will advise government agencies on a research program directed at determining the metallurgical causes of brittle fracture in steel that led to the failure of a number of ships during World War II.

The work is expected to be of a fundamental and partly practical character.

Dr. Mehl, who served in World War II as an attache in the Embassy, London, England, and the simulated rank of brigadier general, formerly was superintendent of the Division of Physical Metallurgy, Naval Research Laboratory, Washington, D. C.

The Carnegie director recently returned from a trip to Europe during which he delivered the Hjalmar Johanson Memorial Lecture in London, England. He also addressed the Swedish Metallographers' Society at the Royal Institute of Technology in Stockholm, Sweden.

Tube Shipments Are High

New York

• • • Steel pipe and tube shipments for the first 6 months of 1948 totaled 3,302,748 tons, an increase of 10.7 pct over the first 6 months for 1947, according to the committee on steel pipe and tube of the American Iron and Steel Institute.

If shipments continue throughout the year at the present rate, a new annual record will be set. 6,117,884 tons shipped in 1947 stands as the peak for yearly shipments.

It was also reported that steel and tube exports have not

essively large since the end of war. Statistics show that only pct of the 1947 total shipments, er than casing, oil line pipe and er tubes, were exported. This lower than any year since 1940, pt for 1945.

pects Decrease in '49 Industrial Expenditures

York

• The National Industrial Conference Board sees a downward and in capital industrial expenditures during 1949, according to its latest monthly survey of current business practices.

The downward trend after 1948 attributed to several factors.

First, the high construction costs be a severe handicap to continued expansion of plant facilities. Next, tapering off of capital needs result from the completion of any of the postwar improvement programs.

Finally, much of the postwar reeling will have been completed, once a further reduction in necessary expenditures.

To date retained earnings have provided the bulk of the capital requirements for more than three quarters of the companies surveyed. At most important source of funds is current depreciation. About half of the companies rely on this method to pay part of their capital expenditures.

In practice most of the companies report that they use a combination of the two methods to meet a large proportion of their capital needs.

Some of the companies revealed that they financed their needs through stock or bond issues. They constituted only about 5 pct of the group. A few others stated that they resorted to bank loans and insurance company loans to meet their capital expenditures.

J.I. Elects Officers

Washington

• At its annual meeting held here, the Steel Joist Institute elected George R. Wernisch president for a second term according to C. H. Luedeman, managing director of the institute.

Mr. Wernisch is president of the Steel Joist and Deck Div. of the Inco Steel Products Corp.

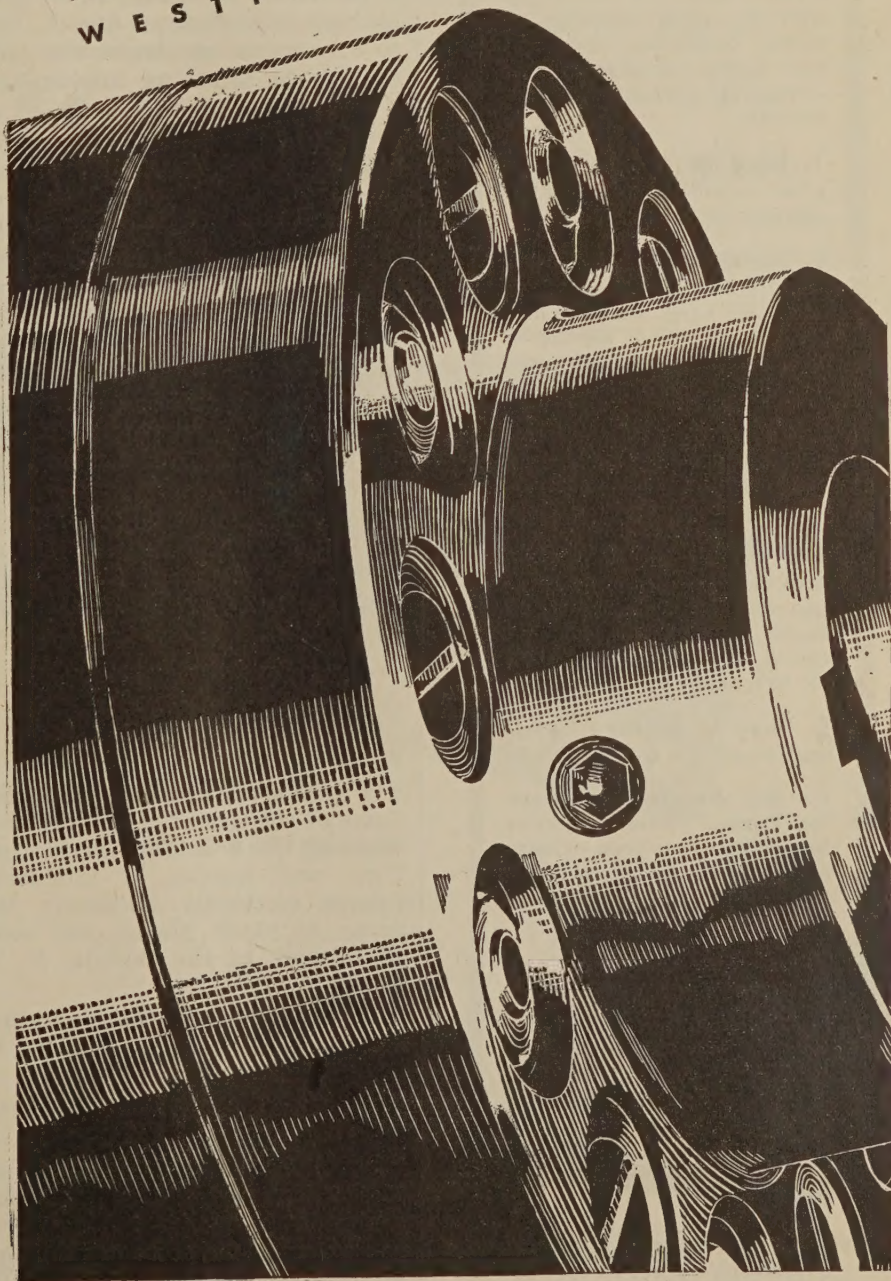
Other officers elected were: James D. Maitland, president of



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NEWS OF INDUSTRY

Colorado Builders Supply Co., vice-president; and C. H. Luedeman, managing director.

The institute's new address has been given as the DuPont Circle Building, 1346 Connecticut Ave., N. W., Washington 6.

Bonds Sold to Cover Capital Expenditures

Chicago

• • • **Inland Steel Co.** on Aug. 3, 1948, negotiated through Kuhn, Loeb & Co. of New York the sale of \$20 million, aggregate principal amount of its 3% Bonds Series H, dated Aug. 1, 1948, maturing Aug. 1, 1978, with interest payable semi-annually, on Feb. 1 and Aug. 1.

The bonds were sold at 101 plus accrued interest from Aug. 1, 1948 to 7 insurance companies who purchased the bonds for investment.

Inland will use the proceeds of the bonds to reimburse the company for capital expenditures made since Dec. 31, 1946.

Wilfred Sykes, president, stated that the capital expenditures for which the company is being reimbursed by the sale of these bonds includes facilities increasing the company's capacity to produce cold rolled sheets, a battery of new coke ovens and a new ore carrier capable of greater tonnages and more trips per season.

Mechanization of its coal mining properties and the construction of a coal cleaning plant at its Price Mine, Kentucky are also well under way.

Builds Large Generator

Pittsburgh

• • • **A 277-ton** power generator—one of the largest of its type ever made by the Westinghouse Electric Corp. and capable of producing enough electricity to supply the needs of 40,000 homes—will soon go to work in the Buffalo, N. Y. area.

It will be added to the generating capacity of the giant Charles R. Huntley Steam Electric Stations of the Buffalo Niagara Electric Corporation.

The huge machine is rated at 100,000 kva and will generate the equivalent of 134,000 hp—as much as produced by a score of the largest railroad locomotives.

Overseas Surplus Are Reduced to \$183 Million

Washington

• • • **Inventories** of overseas plus property have been reduced to \$183 million, much of which consists of installations and other assets having no salable interest, it is reported by the Foreign Liquidation Commissioner. Estimates indicate that 34 pct of the total falls into the unsalable category.

Thus, the commissioner has reported to Congress, the disposal of \$10.2 billion worth of property overseas at the end of the war virtually been completed. It is estimated that little more than \$1 million worth remains to be declared.

The largest portion of the remainder is located in the Pacific and Far Eastern regions—a \$106 million worth. Location of other surplus are: Europe, Africa and Middle East, \$42 million; North America (including Canada), \$10 million; and, Latin America, \$25 million.

July Construction Is Valued at \$1.7 Billion

Washington

• • • **New construction** put in place in July was valued at \$1.7 billion, according to a joint estimate of the Commerce Dept. and Bureau of Labor Statistics. This raises the total for the first seven months to \$9.4 billion, the highest figure in history for a like period.

This is about 36 pct above the dollar volume in 1947 at this season of the year, due to rising costs. However, the physical volume of work is about 15 pct more than the same period 1947.

Privately financed residential building continued to lead the way, accounting for \$667 million of the month's total. Stores and other commercial buildings continued the rise and reached a figure of \$100 million. Industrial construction continued to decline, amounting to \$111 million, \$28 million under July a year ago.

Plans Lectures in Bogota

Bayside, N. Y.

• • • **Dr. G. C. Kuczynski** of Sylvania Electric Products, metallurgical laboratories, a specialist in the electron theory

...tals, will deliver a series of lectures on the physics of metals at National University, Bogota, Colombia, according to Walter E. Angston, manager of the laboratories.

Dr. Kuczynski will be a guest of Joaquin Prieto, professor of metallurgy at National University, whom he met several years ago when Dr. Prieto was a special instructor in the application of quantum mechanics to the electron theory of metals at the Massachusetts Institute of Technology.

Steelmen Invited to Engineers' Exposition

Philadelphia

• **A. J. Fisher**, president of the Iron and Steel Engineers, clarified a long-old misunderstanding when he told reporters here that "every steelman regardless of position in plant or educational background" was invited to attend the Iron and Steel Exposition in Cleveland, Sept. 28 to Oct. 1.

Because the exposition is sponsored by an engineering association, Mr. Fisher continued, "does not mean that an engineering degree is required to permit attendance."

This year the exposition will be devoted to the study and exchange of vital operating information among steelmen. It will also display the latest mechanical and technical advancements in equipment and methods.

Mr. Fisher concluded by stressing the importance "that every steelman feel free to attend."

Schedules Eighth Meeting

Baltimore

• **The Eighth Manufacturers' Products Exhibit** is scheduled to be held here at the Lord Baltimore Hotel from Oct. 26 to 28, according to S. J. Buschman, general chairman. The affair is sponsored by the Purchasing Agents Assn. of Baltimore.

A feature of the exhibit will be the awarding of prizes for the most informative, as well as the most attractive and decorative booths.

A prominent speaker will discuss current problems at the Exhibitors' breakfast, on the second morning of the meeting.



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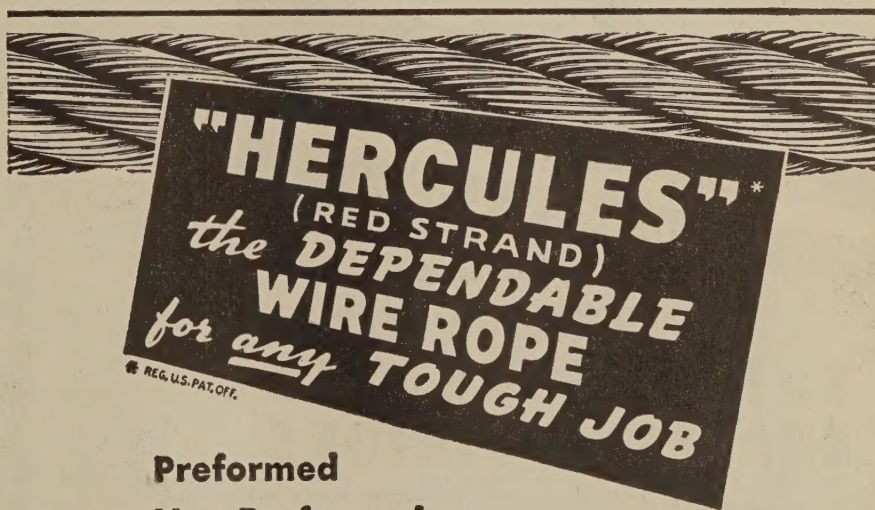
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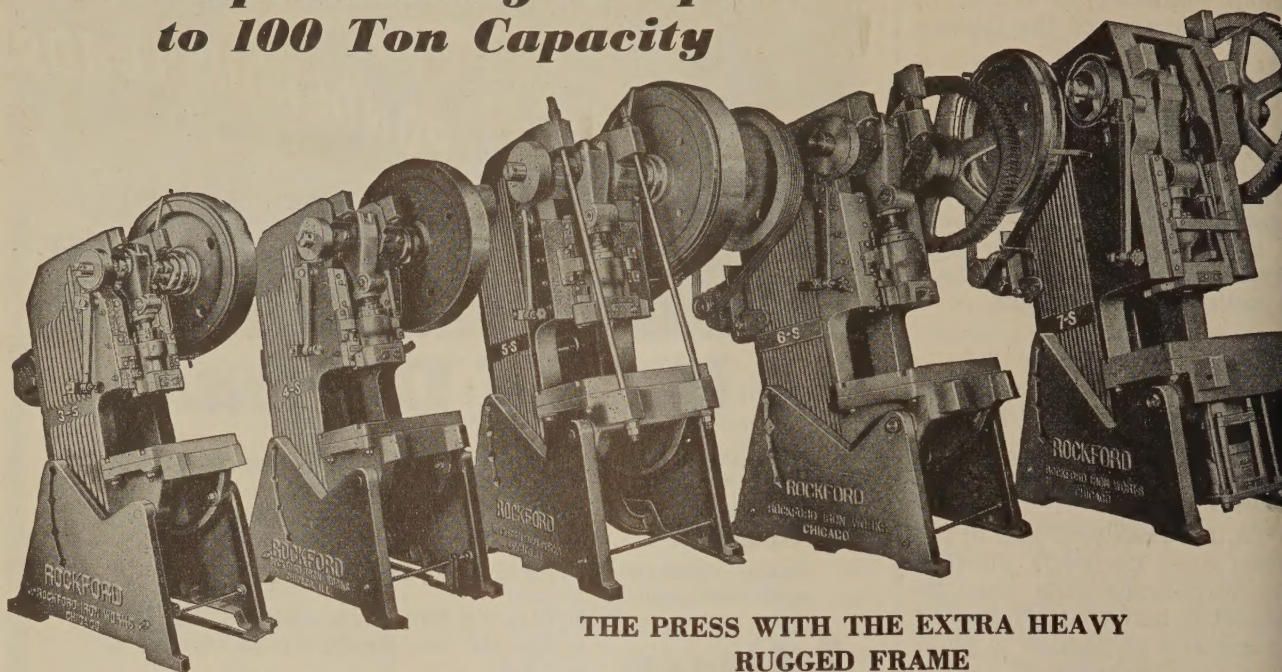
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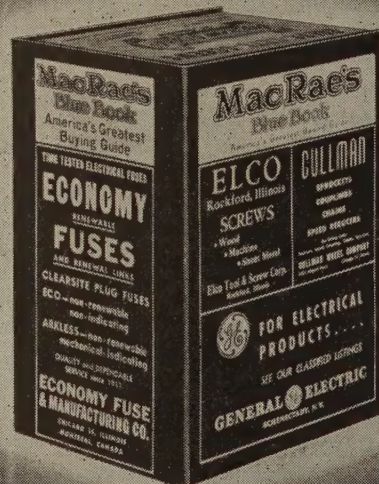


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